Program Description
Animal Care and Use Program

Department of Laboratory Animal Resources

The University of South Carolina

Suite 102
Graduate Science Research Center
631 Sumter Street
Columbia, South Carolina 29208

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For
AAALAC International

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Program Description

Instructions for Completing and Submitting the Program Description for the Institutional Animal Care and Use Program

Section 1. Introduction

A. State the name of the program unit and, if applicable, its parent organization. List all organizations (schools, centers, etc.) included within the program unit.

> The program unit is the Department of Laboratory Animal Resources, University of South Carolina – Columbia. The program includes all colleges and schools on the Columbia campus, the School of Medicine, and the Baruch Institute for Marine Biology and Coastal Research.

B. Give a brief overview of the institution, its purpose and how the animal care and use program relates to the mission of the institution.

> The University of South Carolina is home to more than 200 years of history and tradition, rising from a single building in 1805 on what would become the heart of the campus, the Horseshoe. The 11 buildings that now make up the Horseshoe frame a lush lawn that is an irresistible gathering place. There are currently 39,972 students enrolled and 1,604 full-time faculty members employed by the university.
>
> In addition, the University of South Carolina's:
> -Columbia campus has 324 degree programs through its 14 degree-granting colleges and schools.
> -Faculty generated $270 million in funding for research, outreach and training programs in fiscal year 2017. Carolina is one of only 63 public universities listed by the Carnegie Foundation in the highest tier of research institutions in the U.S.
>
> The Department of Laboratory Animal Resources provides facilities and expertise for teaching and research involving animals for the Columbia campus, the School of Medicine, and the Baruch Institute for Marine Biology and Coastal Research.

C. Note that AAALAC International's three primary standards are *the Guide for the Care and Use of Laboratory Animals* (*Guide*), NRC, 2011; the *Guide for the Care and Use of Agricultural Animals in Research and Teaching* (*Ag Guide*), FASS, 2010, and the European Convention for the Protection of Vertebrate Animals Used for Experimental and Other Scientific Purposes, Council of Europe (ETS 123). Other regulations and guidelines used (U.S. Department of Agriculture (USDA), Public Health Service (PHS) Policy, Good Laboratory Practice (GLP), Canadian Council on Animal Care (CCAC), etc.) may also apply. Describe which of the three primary standards and other regulations and guidelines are used as standards for the institutional animal care and use program and how they are applied. For example, an academic institution in the United States with an Office of Laboratory Animal Welfare (OLAW) Assurance may use the standards of the *Guide* and PHS Policy for all animals, the Animal Welfare Act regulations for covered species, and the *Ag Guide* for agricultural animals used in agricultural research and teaching (see also *Guide*, pp. 32-33). In the European Union, the standards applied might be the *Guide*, ETS 123, Directive 2010/63, and any country-specific regulations.

The University of South Carolina uses the standards of the Guide and PHS Policy for all animals and the Animal Welfare Act regulations for covered species.

D. Describe the organization and include an accurate, current, and detailed organizational chart or charts (see **Appendix 4**) detailing the lines of authority from the Institutional Official to the Attending Veterinarian, the Institutional Animal Care and Use Committee/Oversight Body (IACUC/OB), and the personnel providing animal care. Please include the title, name (*Note:* For individuals whose information is publically available, provide the titles and names; for individuals whose information is not publically available, you may provide titles only.), and degree (if applicable) of each individual at the level of supervisor or above. Names of animal care staff below the title of supervisor need not be included, but the titles and number of animal care personnel under each supervisor should be included. If animal care responsibility is administratively decentralized, including the management of satellite housing areas/locations, the organizational chart or charts must include all animal care programs, indicating the relationship between each administrative unit and personnel, the Attending Veterinarian, and the Institutional Official.

(An organizational chart is attached at Appendix 4)
The animal care and use program is administratively centralized under the Department of Laboratory Animal Resources (DLAR), a Department level organization. The Director is officially designated as both the University (Attending) Veterinarian as well as Director of DLAR. Dr. Barlow reports directly to the Dr. Prakash Nagarkatti, the Vice President for Research. Thomas Coggins, Director of Research Compliance, is the Institutional Official. Mr. Coggins also reports directly to Dr. Nagarkatti.
There are three aquatic facilities that are PI-maintained. Two are zebrafish systems within the Department of Biology for [redacted] and [redacted]. The third is an aquatic facility maintained by the Department of Earth and Water Sciences. This program is directed by [redacted] and the fish are maintained by [redacted]

E. Identify the key institutional representatives (including, but not limited to, the Institutional Official; IACUC/OB Chairperson; Attending Veterinarian; animal program manager; individual(s) providing biosafety, chemical hazard, and radiation safety oversight; etc.);

and individuals anticipated to participate in the site visit.

Prakash Nagarkatti, Ph.D., Vice President for Research
Thomas Coggins, Director, Office of Research Compliance (Institutional Official)
Kenneth Walsh, Ph.D., Chair, IACUC
Shayne Barlow, DVM, Ph.D., DACLAM, Director, DLAR (Attending Veterinarian)
[redacted] Facility Manager, DLAR
[redacted], IACUC Coordinator
[redacted], Biosafety Officer
Members of the IACUC

F. Briefly describe the major types of research, testing, and teaching programs involving animals and note the approximate number of principal investigators and protocols involving the use of animals. As mentioned in the instructions, please complete **Appendix 5** (Animal Usage) or provide the information requested in a similar format as an Appendix.

Animals are used in a wide variety of projects including basic science research in biology and medicine. USC's biomedical research encompasses such diverse subjects as cancer, bioengineering, nanotechnology, cardiovascular research, neuroscience, diabetes prevention, nanotechnology, and geriatrics. There are approximately 75 active principal investigators with about 175 active animal use protocols.

G. Note the source(s) of research funding (grants, contracts, etc.) involving the use of animals.

The University of South Carolina receives substantial funding from federal sources. Extramural funding at the University of South Carolina was $270 million in fiscal year 2017. The National Institutes of Health is the University's single largest sponsor followed by the National Science Foundation.

H. List other units (divisions, institutes, areas, departments, colleges, etc.) of your organization that house and/or use animals that are not included in this Description. If any of these are contiguous, physically or operationally (e.g., same IACUC/OB, same animal care staff), with the applicant unit, describe the association. Explain why such units are not part of this program application.
Note: Questions regarding this section should be forwarded to the AAALAC Office.

All USC – Columbia units and the Baruch Institute for Marine Biology Field Lab are included in the program. One regional campus, USC-Aiken, houses research animals but elected not to participate in AAALAC, Int. accreditation. Those decisions were made at their organizational level and no specific reasons have been provided by them. That campus maintains its own IACUC, IO, and AV.

I. Contract Facilities: If the institution contracts for animal care facilities or services for animals owned by the institution, the contractor and its AAALAC International accreditation status must be identified. If a contractor's animal care and use program is not accredited by AAALAC International, a brief description, following this Program Description outline, of the relevant contractor's programs and facilities must be provided. In addition, the species and approximate average number of animals housed in the contract facilities and the approximate distance between the institution's animal facility and the contract facility must be noted. Incorporation of the contractor program into the site visit schedule will be discussed with institutional representatives. If the institution does not contract for animal care facilities or services, so note.

The USC School of Medicine is located on the grounds of the Dorn Veterans Administration Hospital and both institutions maintain animal facilities. The institutions operate as separate entities and maintain separate IACUCs. There is a Memorandum of Understanding in place for joint projects between the institutions. In many projects, animals are brought from one institution to another for experimental procedures involving shared instrumentation equipment or to utilize housing facilities not available at the home institution. The animal care and use programs for the two institutions are closely integrated. All current VA faculty also have USC faculty appointments. Dr. Barlow is the Attending Veterinarian at both facilities. USC DLAR provides husbandry for both facilities. [redacted] is the IACUC Administrator for both institutions.

J. Note other relevant background that will assist reviewers of this report.

Section 2. Description

I. Animal Care and Use Program

A. Program Management

1. Program Management Responsibility [*Guide*, pp. 13-15]

a. The Institutional Official [*Guide* pp. 13-14]
Describe how program needs are clearly and regularly communicated to the Institutional Official by the Attending Veterinarian, IACUC/OB, and others associated with the program.

The IACUC Administrator provides IACUC meeting agenda and minutes to the Institutional Official (IO) monthly. Semiannual inspection results and Program reviews are provided twice yearly. The IO attends IACUC meetings and Program reviews periodically.
In addition to monthly IACUC meetings, the Attending Veterinarian (AV) and the IACUC Chair (IC) communicate with the IO by phone, email, and in person as needed.
The IO has computer access to all Animal Use Protocols (AUPs) that have been submitted, are under review, and that have been approved.

b. Role of the Attending Veterinarian [*Guide*, p. 14]

i. Describe the institutional arrangement for providing adequate veterinary care. Although individual name(s) and qualifications will be described below, identify by title the veterinarian(s) responsible for the veterinary care program, including:
- a list of responsibilities
- a description of the veterinarian's involvement in monitoring the care and use of laboratory animals
- the percentage of time devoted to supporting the animal care and use program of the institution if full-time; or the frequency and duration of visits if employed part-time or as a consultant.
Note: If preferred, this information may be provided in a Table or additional Appendix.

The University of South Carolina employs a fulltime veterinarian to provide veterinary care. Shayne Barlow, DVM, PhD, DACLAM, is the Attending Veterinarian (AV) and the Director of the Department of Laboratory Animal Resources (DLAR). Dr. Barlow plans and oversees disease detection and surveillance, prevention, diagnosis, treatment and resolution of animal health issues. He oversees and advises on issues such as handling and

restraint, anesthetic, analgesics and tranquilizing drugs as well as methods of appropriate euthanasia. Dr. Barlow oversees all aspects of surgical and postsurgical care. As DLAR Director, he oversees all aspects of the husbandry program. He is involved in the review and final approval of all Animal Care and Use Protocols. Dr. Barlow oversees the training of institutional staff in the care and use of laboratory animals as described below. He assists in the monitoring of the Occupation Health and Safety Program and advises on and monitors biohazard control policies and procedure relevant to the animal care and use program. He is employed full time with a 100% commitment in this role.
[redacted] serves as a clinical back up veterinarian when Dr. Barlow is not available. [redacted] serves on a contract basis with an approximate 5% commitment to this position.

ii. List others (e.g., Principal Investigators, veterinarians serving as Principal Investigators, veterinary faculty/staff, technical staff, farm managers) who have a *direct role in the provision of veterinary care* and describe their responsibilities. The Organizational Chart(s) provided in **Appendix 4** must depict the reporting relationship between these individuals and the Attending Veterinarian.
Note: If preferred, this information may be provided in a Table or additional Appendix.

The PI is responsible for monitoring his/her own animals on a regular basis and assuring the personnel in the laboratory receive training on specific procedures in that lab.
Research personnel working with a PI regularly handle and observe the animals. They are responsible for reporting any abnormal animals to DLAR.
DLAR animal care technicians observe animals every day including weekends and holidays. They report unusual findings or sick/injured animals to their supervisor or to a veterinary technician in DLAR.
Veterinary Technicians report directly to the veterinarian.

c. Interinstitutional Collaborations [*Guide*, p. 15]
Describe processes for assigning animal care and use responsibility, animal ownership and IACUC/OB oversight responsibilities at off-site locations for interinstitutional collaborations.

Collaborations, when present, are handled on a case-by-case basis by the IO with input from the IACUC and the AV. The Institution may require its own IACUC review or may accept the collaborating institution's review. Animal care and use responsibility and ownership is assumed by the Institution in possession of the animals and is described in a memorandum of understanding. Currently, the only collaboration is with the Dorn VA Medical

Center. The University of South Carolina's animal care and use program is closely associated with the Dorn VA Medical Center. The programs share a common Attending Veterinarian and IACUC Administrator. USC DLAR provides husbandry to all animals housed at the Dorn VA Medical Center.

2. Personnel Management

a. Training, Education, and Continuing Educational Opportunities

Describe *how* the IACUC/OB provides *oversight* and *evaluates the effectiveness* of training programs and the assessment of personnel competencies. Describe how training is documented.

Note: Do not include details about the training program, which should be described in the following sections.

All research personnel who handle animals must complete specific on-line training modules prior to being added to a protocol or working with animals. These modules include instruction in the humane practice of animal care and use, instruction on research methods that minimize the number of animals required to obtain valid results and limit animal pain and distress. Completion of species- and procedure-specific modules is required for each species the individual will be working with. Successful completion of modules triggers a notification to DLAR. At that time, the individual is entered into the appropriate database and can be added to Animal Use Protocols. Training is repeated every three years. These records are maintained electronically and are available to IACUC members for review.

The veterinarian, veterinary technician, and animal technologists from Animal Resource Facilities conduct hands-on training and species-specific workshops for personnel staff as needed. Participation is recorded and made available to the IACUC when requested.

The veterinarian, veterinary technicians, and the Animal Technologists work on an individual basis with animal users and who need training on specific procedures. This activity is routinely not recorded.

Evaluation of effectiveness of the various training modalities is conducted through discussion of noncompliance incidents, reports from the post-approval monitoring personnel, and observations of DLAR staff of research personnel conducting their activities. Training is altered when deficiencies are noted.

i. Veterinary and Other Professional Staff [*Guide*, pp. 15-16]

For the Attending Veterinarian and other individuals having a direct role in providing veterinary medical care (veterinarians, other professional staff listed above, private practitioners, etc.), provide: name, credentials (including

degrees), and a description of their qualifications, training, and continuing education opportunities.
Note: Please do not provide curriculum vitae of personnel; if preferred, this information may be presented in a Table or additional Appendix.

Shayne C. Barlow, DVM, PhD. Diplomate, American College of Laboratory Animal Medicine (2004). Laboratory Animal Residency and postdoctoral training, University of Alabama at Birmingham. Over 20 years' experience in laboratory animal medicine. CE: Attends AALAS, ACLAM Forum, AVMA and other LAM-related meetings as well as scientific meetings in his area of research.

[redacted] Licensed in South Carolina as a veterinary technician working in laboratory animal medicine. CE: Attends AALAS and SCAV conferences annually as wells as online modules in LAM year-round.

[redacted] Eight years veterinary field experience, one year experience in laboratory animal medicine. CE: Attends AALAS and SCAV conferences annually as well as lab animal medicine online modules year-round.

[redacted] Facility Manager.
Registered Laboratory Animal Technologist, CE: Active in AALAS, SE/AALAS and District IV AALAS. Regular attendance at AALAS, SE/AALAS and District meetings, and U.S.C. management seminars

[redacted] Over 20 years' experience as a veterinarian, most of it in laboratory animal medicine. [redacted] serves as a clinical back up veterinarian when Dr. Barlow is not available.

ii. Animal Care Personnel [*Guide*, p. 16]

1) Indicate the number of animal care personnel.

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2) Summarize their training, certification level and type, experience, and continuing education opportunities provided.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Training Levels:

Entry Level – One on one training with supervisor	11
Assistant Laboratory Animal Technician (ALAT)	4
Laboratory Animal Technician (LAT)	0

Laboratory Animal Technologist (LATG)	2
Licensed Veterinary Technician (LVT)	1

All animal care personnel complete the relevant online training and are provided on-the-job orientation and training by working directly with a supervisor until the supervisor feels that they are competent to work independently within the facility.

DLAR maintains study materials and manuals for AALAS certification and conducts certification classes. The department pays AALAS exam fees. DLAR maintains institutional membership in AALAS and the Southeastern chapter of AALAS and animal care personnel are designated as the members. In addition to in-house training, DLAR provides training opportunities to animal care personnel at regional, district, and national AALAS meetings. The university provides numerous short courses open to employees ranging from leadership and team building to computer software use. Funding for these classes is provided by DLAR. Permanent employees may take one course per semester at no cost through a university program.

iii. The Research Team [*Guide*, pp. 16-17; 115-116; 122; 124]

1) Describe the *general mechanisms* by which the institution or IACUC/OB ensures that research personnel have the necessary knowledge and expertise in the animal procedures proposed and the species used.

1. All personnel who work with animals must complete specific on-line training modules. Training is completed before personnel can work with animals or be added to a protocol.

2. DLAR conducts hands-on training and species-specific workshops for research personnel when requested by the PI or when required by the IACUC or AV.

3. The veterinarian, veterinary technician, and the Animal Technologists work on an individual basis with animal users and who need training on specific procedures. This can be by request or by IACUC requirement.

4. DLAR and the IACUC uses emails and its website to inform all animal users of policies, procedures, and regulations governing the use of laboratory animals.

5. Orientation on Humane Care and Use of Laboratory Animals is mandatory for graduate students entering the Biomedical Science Graduate Program. This course is held annually.

a) Briefly describe the content of any required training.

All online training is contracted through a commercial provider (AALAS Learning Library). These modules provide instruction in the humane practice of animal care and use, instruction on research methods that minimize the number of animals required to obtain valid results and limit animal pain and distress, instruction on personal hygiene, the use of hazardous agents, zoonotic diseases and personal protection. Completion of species-specific modules is required for each species the individual will be working with. Personnel are required to complete modules relevant to the species and techniques used.

b) Describe the timing of training requirements relative to the commencement of work.

The IACUC review process is designed such that an individual must complete the minimal training requirements (i.e., online modules) PRIOR to submitting or being added to a protocol. Supplemental and optional training can occur before or after a person commences working with animals. For example, someone who has never handled animals would be given that hands-on training prior to the commencement of work. A trained and/or experienced person having difficulties with a procedure may be given assistance after work has begun and problems have been identified.

c) Describe continuing education opportunities offered.

All online training opportunities described can be repeated at any time, including the completion of modules that are not part of the minimal requirements. Research staff attend scientific meetings related to their specific areas of expertise. In addition, research staff are able to attend all DLAR continuing education opportunities, such as the weekly classes to prepare for AALAS certification. DLAR staff have opportunities to attend regional, district, and national AALAS meetings.

2) Describe the process(es) to ensure surgical and related procedures are performed by qualified and trained personnel, including:

- who determines that personnel are qualified and trained for surgical procedures
- the roles that the Attending Veterinarian and IACUC/OB have in this determination [*Guide*, pp. 115-116]

Personnel who will conduct surgery are listed in the Animal Use Proposal. The IACUC evaluates qualifications during the AUP review process and may ask the veterinarian or veterinary staff to observe or assist PIs or technicians to assure proper technique if concerns arise.

Rodent surgery is usually performed by the PI or experienced technicians/graduate students trained directly under the supervision of the PI. The Principal Investigator has the primary responsibility for training laboratory personnel on research procedures, including surgery, related to specific research protocols. DLAR assists with this training at no cost when requested.

The IACUC may direct that an investigator or graduate student receive training from another investigator who is known to be competent in the proposed procedure. The IACUC coordinates the training.

Nonrodent surgeries are currently performed exclusively by School of Medicine faculty members, and all nonrodent surgeries currently directly involve the AV. The veterinarian, veterinary technician, or DLAR technologists may also assist faculty members with surgeries when requested.

3) Describe the training and experience required to perform anesthesia. [*Guide*, p. 122]

Personnel performing rodent anesthesia are experienced principal investigators or technicians/graduate students trained by the PI and/or DLAR personnel. DLAR provides training on rodent anesthesia if requested, and demonstrations of inhalation anesthesia and techniques for injectable anesthetics are given in the hands-on workshops. All personnel performing rodent surgery are required to complete anesthesia training as part of online training program.

Currently, all nonrodent anesthesia is performed and monitored by DLAR veterinary technicians. All nonrodent procedures are performed in the GSRC under close supervision of the AV.

4) Describe how the proficiency of personnel conducting euthanasia is ensured (especially physical methods of euthanasia). [*Guide*, p. 124]

Most euthanasia is performed by personnel from DLAR. The animal care staff is trained on the job by the supervisor. Methods of euthanasia for rodents are covered and demonstrated in the hands-on workshops for personnel including PIs, lab technicians and graduate students. In special cases where decapitation or cervical dislocation is used, the PI instructs his/her personnel. The IACUC requires justification for physical methods such as decapitation or cervical dislocation without prior anesthesia and reviews the experience of the person(s) who will perform the procedure. Nonrodent euthanasia is carried out by DLAR veterinary technicians.

b. Occupational Health and Safety of Personnel [*Guide*, pp. 17-23]

i. Institutional Oversight [*Guide*, pp. 17-19]

1) List the institutional entities (units, departments, personnel, *etc.*) that are involved in the planning, oversight, and operation of the institutional occupational health and safety program related to animal care and use (e.g., office(s) of environmental health, institutional health services or clinics (*including contracted health services*), industrial hygienists, Institutional Biosafety Committee(s) and/or Officer(s), Radiation Safety Committee(s) and/or Officer(s).

- Include a brief description of their responsibilities and qualifications.
- If contracted services are used, also include their location (e.g.,remote offices to which personnel must report).

Shayne C. Barlow, DVM, PhD. Diplomate, American College of Laboratory Animal Medicine (2004). Laboratory Animal Residency and postdoctoral training, University of Alabama at Birmingham. Over 20 years' experience in laboratory animal medicine.

[redacted], Facility Manager.
Registered Laboratory Animal Technologist, CE: Active in AALAS, SE/AALAS and District IV AALAS. Regular attendance at AALAS, SE/AALAS and District meetings, and U.S.C. management seminars

[redacted]
IACUC Coordinator B.S. – Zoology, M.S. Public Health.
CE: Attendance at IACUC 101 and other CE meetings, Active with IACUC administrators' group for sharing information, organization.

[redacted], Biosafety Officer

[redacted], Chemical Hygiene Officer and Lab Safety Program Manager

Healthworks is an occupational medicine practiced contracted by the University to provide services to its OHSP. Healthworks employs a team of occupational health physicians and nurses to meet the program's needs. The primary interface between the animal care and use program and Healthworks is [redacted]. [redacted] has 39 years of experience as a nurse and has been practicing occupational health nursing since 1987. [redacted] is trained and has experience in work-related injury treatment, DOT, Pre-Employment, Fit for Duty and Return to Work Physicals, substance abuse testing, medical surveillance exams, vaccinations, health screenings, training and education, as well as staffing onsite medical clinics.

2) Describe methods to identify work-related hazards and the processes used to evaluate the significance of those hazards in the context of duties and tasks. Describe both common approaches and differences, if applicable, for categories of personnel such as, but not limited to, researchers, veterinarians, husbandry staff, cage-washing staff, students, housekeeping, physical plant staff, security personnel, IACUC/OB members (including non-affiliated members), contractors, visitors, etc. [*Guide*, pp. 18-19; see also Chapters 2 and 3 in Occupational Health and Safety in the Care and Use of Research Animals, NRC 1997.].

Hazards associated with research projects (bites, chemicals, radiation, allergens, zoonoses) are assessed by the AV, the IACUC, DLAR staff and Environmental Health and Safety Program staff through review of applications to the IACUC and the IBC.

Training in chemical and radiation safety are provided by the University and completion are required prior to working with those hazards. Appropriate personal protective equipment is provided by the University.

During the IACUC review process, potential hazards are identified. DLAR, with input from Environmental Health and Safety, has established SOPs for working with each hazardous agent. If the agent described in the Animal Use Protocol falls under an already approved SOP, the Principal Investigator is required to reference that SOP in the AUP and follow the SOP in practice. If a unique hazard is identified, DLAR and Environmental Health and Safety generate an appropriate SOP prior to approval of the AUP.

3) Describe methods and frequency of reassessing work-related hazards.

Risk assessment for work-related hazards is primarily associated with the IACUC and IBC protocol review processes. Thus, each activity is reviewed annually at a minimum or more frequently if changes are required or problems are identified.

4) Describe institutional programs or methods used to track and evaluate safety-related workplace incidents, including injuries, exposures, accidents, etc. Include the frequency of such assessments. [*Guide*, pp. 18-19]

When an incident occurs, steps are taken to stabilize the incident and personnel involved are required to report the incident to their supervisor. The supervisor then files an incident report to Human Resources and Environmental Health and Safety. Incident investigations are conducted following injuries, exposures or accidents to determine the root cause and define measures to mitigate any problems identified. The incident reports are maintained by different programs depending on the nature of the accident and/or injury.

Inspections and consultations are utilized to identify safety risks that may result in an incident, document deficiencies, and implement corrective actions to minimize workplace incidents.

ii. Standard Working Conditions and Baseline Precautions

The following section pertains to the Occupational Health and Safety Program for all personnel associated with the animal care and use program. Specific information regarding the use of hazardous agents is included in ***subsection iii*** below.

1) Medical Evaluation and Preventive Medicine for Personnel [*Guide*, pp. 22-23] *Note:* Include blank forms used for individual health assessment as **Appendix 6.**

a) Describe who (e.g., personnel assigned to job/task categories in I.A.2.b.i.2) above) receives personal medical evaluation as a component of individual risk assessment. Describe who are ***not*** included and/or exempted from personal medical evaluation. *Note:* Do not include the names of personnel.

All faculty, staff, and students with access to the animal facility receives a medical evaluation and risk assessment. Exceptions are visitors, physical plant personnel, and police. These individuals are made aware of the OHSP and its availability to them free of charge. They must acknowledge this in writing prior to entering the facility.

b) Describe provisions for allowing an individual to decline participation in all or parts of the medical evaluation and preventive medicine programs (if applicable). Provide an estimate (percentage) of personnel associated with the animal care and use program that have declined participation in the medical evaluation program.

Faculty, staff, and students must undergo a medical evaluation, risk assessment, and consultation with an occupational health professional prior of declining continued participation in the OHSP. At this time, less than 2% of the individuals seen by the OHSP clinic have declined further participation.

c) Describe provisions for assuring confidentiality of medical information.

The OHSP contracts with a medical clinic compliant with all applicable medical privacy laws. The only information relayed to DLAR and the USC IACUC is confirmation of the individual's fitness to work with animals, any respirator needs, and the individual's enrollment/declination to participate in the OHSP.

d) Describe safety considerations for individuals with incidental exposure to animal care and use (e.g., contractors, personnel working in open laboratories).

Contractors and other infrequent visitors to the animal facility are informed about the OHSP, their ability to participate at no charge to them, and the risks involved in working around animals. They must acknowledge this in writing prior to entering the facility. They are not allowed to go into areas where cages are open or animal work is being performed.

Individuals removing animals from the animal facility to laboratories are required to transport them in microisolator cages and are encouraged to use available biosafety cabinets (and chemical hoods in some areas) when working with animals. Dedicated rodent surgical suites are available in several areas to minimize animal exposure to uninvolved personnel.

e) Describe general features of the medical evaluation and preventive medicine programs, within the context of work duties, including:

- pre-employment/pre-assignment health evaluation,
- medical evaluations (including periodicity),

- diagnostic tests (e.g., for tuberculosis),
- precautions for working with potentially hazardous species (e.g., nonhuman primates, sheep, venomous species)
- immunization programs, and
- procedures for communicating health related issues.

Prior to being allowed access to animal facilities, individuals must undergo a health evaluation, risk assessment, and consultation with an occupational health professional. USC does not currently work with potentially hazardous species, so special diagnostics, precautions, and immunizations are not required. The focus is on allergy diagnosis and prevention and tetanus immunization.

The OHSP professional communicates the individual's fitness to work with animals, participation/declination of participation in the OHSP, and respirator needs back to the IACUC via Form C.

f) Describe any other entities that provide medical services (e.g., emergency care, after-hours care, special medical evaluation, contracted services). Include a brief description of their credentials and/or qualifications, and how these entities remain knowledgeable about animal- or institution-related hazards and risks.

USC maintains a contract with USC Healthworks to provide OHSP services for any individual with potential significant exposure to research animals. USC Healthworks provides similar services to other entities in the area and its physicians and staff are trained in occupational medicine. There are currently no significant concerns based on the scope of ongoing research beyond laboratory animal allergies and bites/scratches.

2) Personnel Training Regarding Occupational Health and Safety [*Guide*, p. 20]

Describe general educational program(s) to inform personnel about:

- allergies,
- zoonoses,
- personal hygiene,
- physical injuries in animal facilities (e.g., noisy areas, large quantities of chemicals such as disinfectants, ergonomics) or species used (e.g., nonhuman primates, agricultural animals),
- other considerations regarding occupational health and safety.

Include in the description a summary of the topics covered, including:

- Entities responsible for providing the training
- Frequency of training or refresher training

Note: Do not include special or agent-specific training for personnel exposed to experiment-related hazardous agents; this will be provided in **Section iii.3** below.

All personnel with animal facility access are provided training on personal hygiene and potential risks involved in working with specific species, hazardous agents, and recommendations for personnel who are, or become, pregnant, ill or immunosuppressed through the online training program. Online training also includes this information and must be completed every three years at a minimum to maintain facility access.

This information is also provided in pamphlets and posters placed at the entrance to each animal facility.

3) Personal Hygiene [*Guide*, p. 20; *Ag Guide* pp. 4-5]

a) List routine personal protective equipment and work clothing provided and/or required for animal care personnel, research and technical staff, farm employees, etc.

All animal care personnel are provided with multiple sets of surgical scrubs. Laboratory coats are also provided, and animal caretakers are provided with safety glasses and hearing protection. Goggles and full-face shields are placed in areas where chemicals are used, and rubber boots are provided for wet areas. Coveralls and rubber boots are available for personnel working with animals such as pigs. Disposable personal protective equipment includes caps, gloves, shoe covers, and dust/mist masks. Plastic aprons and special protective gloves are provided as needed in specific areas such as cage wash. When required, personnel are provided with respirator masks under the direction of Occupational Health personnel.

b) Describe arrangements for laundering work clothing.

All clothing is laundered utilizing in-house facilities.

c) Describe provisions and expected practices for washing hands, showering, and changing clothes, including instances where work clothes may be worn outside the animal facility.

Men's and women's locker rooms with toilets, shower facilities, lockers, and changing room are provided at the GSRC, School of Medicine and Discovery.

Hand sinks are installed in each animal room at GSRC and School of Medicine, and in the Baruch (fish) laboratory in Earth and Water Science. Hand sinks are located directly outside of the animal rooms in the Discovery building.

The Baruch Field Laboratory at Georgetown, SC has locker and shower facilities for personnel working at the field station.

Animal care personnel may wear work clothing in the immediate area outside the animal facility, e.g. at the dock area, and to travel between facilities. Provision is made for assuring that clothing is changed as necessary when personnel move between facilities.

Personnel are not permitted to wear work clothing to/from work or on personal business.

d) Describe policies regarding eating, drinking, and smoking in animal facilities.

Eating, drinking and smoking are prohibited in animal areas, DLAR procedure areas, and service areas. The University of South Carolina has a Smoke-free policy that prohibits smoking inside any building. Eating and drinking are allowed in the GSRC and Discovery animal facility break rooms and in the office at the School of Medicine.

4) Standard Personnel Protection [*Guide*, pp. 21-22]

a) Describe facility design features, equipment and procedures employed to reduce potential for physical injury inherent to animal facilities (e.g., noisy areas, large quantities of chemicals such as disinfectants, ergonomics) or species used (e.g., nonhuman primates, agricultural animals).

Animal care staff are provided training on standard operating procedures established for each identified chemical hazard and bio-hazard used within the facility. Personal protective equipment including items such as scrubs, gowns, gloves, respirators, shoes covers, eye protection, and hearing protection are all provided to reduce the potential for injury.

In addition, mechanical and engineering controls have been put into place to provide protection when possible. This includes the provion of HEPA-filtered changing stations, HEPA-filtered bedding dump stations, fume hoods, and biosafety cabinets throughout the facilities.

b) Describe likely sources of allergens and facility design features, equipment, and procedures employed to reduce the potential for developing Laboratory Animal Allergies (LAA).

The laboratory mouse is the most common species housed at USC, which creates a significant risk for laboratory animal allergies. With few exceptions mandated by experimental design, mice are housed on individually ventilated racks with HEPA-filtering of the supply and exhaust. HEPA-filtered changing stations are available in the majority of rooms. Portable HEPA-filtered changing stations are moved from room to room for cage changing. HEPA-filtered dumping stations are used in cage wash to reduce allergen exposure. For individuals diagnosed with laboratory animal allergy, respirators and annual FIT testing are provided at no cost.

c) Describe likely sources of zoonoses and facility design features, equipment, and procedures employed to reduce potential exposure to zoonoses.

Mice, Peromyscus spp., and rats are the most common species currently in use. They are obtained from commercial vendors or from breeding colonies where the risk of contracting zoonotic disease is greatly reduced. Personnel bit by rodents are required to be reported and seen by the OHSP provider. Tetanus immunization is provided by the OSHP clinic at no charge.

Personnel working with swine could theoretically be exposed to zoonotic agents such as swine erysipelas (Erysipelothrix rhusiopathiae), although it has not been observed in our animals. Prevention is accomplished by basic PPE to prevent skin-to-skin contact.

d) Describe the procedures for the maintenance of protective equipment and how its function is periodically assessed.

Biosafety cabinets are certified annually. Most PPE is disposable. Labcoats and scrubs are laundered daily.

e) Respiratory Protection

i) Describe situations where respiratory protective equipment is available or required, such as cage washing facilities, feedmills, etc.

Respirators are not currently required in any areas. Some individuals are required to wear respirators due to allergies as determined by the OH&S program.

ii) Describe programs of medical clearance, fit-testing, and training in the proper use and maintenance of respirators.

OHSP personnel perform medical evaluation, fit-testing, and training to those required to wear respirators due to laboratory animal allergy. At this time, no other individuals wear respirators.

iii) Describe how such respiratory protective equipment is selected and its function periodically assessed.

OHSP personnel evaluate the patient and fit-test multiple models of respirators to ensure comfort, fit, and function. The make, model, and size of the respirator are communicated to DLAR via Form C. DLAR purchases the respirators and keeps them stocked for the employee requiring their use.

f) Heavy Equipment and Motorized Vehicles

i) Provide a general list of the types of cage-processing equipment used, such as rack/cage washers, tunnel washers, robotics, and bulk autoclaves. Describe training programs, informational signage, and other program policies designed to ensure personnel safety when working with such equipment.
Note: Details of specific equipment installed in animal facility(ies) are to be provided in **Appendix 15** (Facilities and Equipment for Sanitizing Materials).

DLAR maintains three facilities, each having:

1. One tunnel washer
2. One rack washer
3. One or more small/medium (not walk-in) autoclaves

Personnel are trained in the use of the equipment when hired or when new equipment is obtained. Tunnel washers are equipped with emergency stop mechanisms and explanatory signage on both sides. Rack washers are equipped with emergency stop mechanisms both inside and outside with appropriate signage. All personnel are trained on how to disable the machine if they become trapped inside or if they observe someone trapped inside.

ii) List other heavy equipment such as scrapers, tractors, and farm machinery (manufacturer name, model numbers, etc. are not necessary). Describe training programs, informational signage, and other program policies designed to ensure personnel safety when working with such equipment.
Note: If preferred, this information may be provided in a Table or additional Appendix.

N/A

iii) If motorized vehicles are used for animal transport, describe how the driver is protected from exposure to hazards such as allergens or zoonoses and decontamination methods employed. Also describe instances where vehicles may be shared between animal and passenger transport.

All animals moving among facilities are transported by DLAR in a vehicle with physical separation of the passenger cab and the animal compartment. The vehicle is equipped with two independent HVAC systems, one for the passenger cab and one for the animal compartment.

g) Describe safety procedures for using medical gases and volatile anesthetics, including how waste anesthetic gases are scavenged.

Volatile aesthetics must be used with appropriate scavenging equipment regardless of the location. Surgical suites and laboratories where surgeries are performed are equipped with precision vaporizers and either charcoal or vacuum scavenging systems. For euthanasia or for some very brief clinical procedures, volatile anesthetics may be used in a bell jar or similar apparatus so long as the animal does not come into contact with the agent. The procedure must be carried out under a fume hood.

iii. Animal Experimentation Involving Hazards [*Guide*, pp. 20-21]

1) List, according to each of the categories noted below, hazardous or potentially hazardous agents currently approved to be used in animals that are or will be maintained for more than a few hours following exposure. If the hazardous agent cannot be listed by name for security/proprietary reasons, identify it by the general category of agent and level of hazard.

Note: If preferred, this information may be provided in a Table or additional Appendix.

a) Biological agents, *noting hazard level* (CDC Biohazard Level, Directive 93/88 EEC, CDC or USDA/DHHS Select Agent, etc.). Examples may include bacteria, viruses, viral vectors, parasites, human-origin tissues, etc.

Adeno-associated virus (AAV) (ABSL-1)
Adenovirus (ABSL-2)
Clostridium difficile (ABSL-2)
Helicobacter spp. (ABSL-2)
Herpes Virus (ABSL-2)
Lentivirus (ABSL-2)
Salmonella e. typhimurium (ABSL-2)
Streptococcus pneumoniae (ABSL-2)

b) Chemical agents, *noting general category* of hazard (toxicant, toxin, irritant, carcinogen, etc.). Examples may include streptozotocin, BrdU, anti-neoplastic drugs, formalin, etc.

1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (Toxicant)
5-flourouracil (Toxicant)
7,12-Dimethylbenz[a]anthracene (Carcinogen)
Atrazine (Toxicant)
Azoxymethane (Toxicant, Irritant, Carcinogen)
Benomyl (Toxicant, Irritant)
Benzo[a]pyrene (Toxicant, Carcinogen)
Bromo-deoxyuridine (Mutagen, Toxicant, Irritant)
Bromodichloromethane (Toxicant, Irritant, Carcinogen)
Chlorpyrifos (Toxicant)
Chlorpyrifos-oxon (Toxicant)
Cisplatin (Toxicant)
Cl-amidine (Irritant)
Dextran sulfate sodium (Irritant)
Diethylstilbestrol (Carcinogen)
Di-nitro-fluoro-benzine (Carcinogen, Irritant, Toxicant)
Doxorubicin (Irritant, Carcinogen)
Estrodiol and related compounds (Carcinogens)
6-Formylindolo(3,2-b)carbazole (Irritant)
Glyphosate (Irritant, Toxicant)
Lead acetate (Irritant, Toxicant)
Malathion (Toxicant, Carcinogen)
Methylcholanthrene (Carcinogen)
Microcystin LR (Toxicant)

Oxazolone (Irritant)
Paclitaxel (Toxicant, Irritant)
Panaxynol/Falcarinol (Irritant, Toxicant)
Permethrin (Toxicant, Carcinogen)
Pertussis toxin (Toxicant, Irritant)
Phenylhydrazine (Toxicant, Irritant)
Pyrazole (Toxicant, Irritant)
Pyridostigmine Bromide (Toxicant, Irritant)
Staphylococcus Enterotoxin A or B (Below Select Agent Amounts, Toxicants)
Streptozotocin (Carcinogen, Toxicant)
Tamoxifen (Carcinogen, Teratogen, Toxicant)
2,3,7,8-Tetrachlorodibenzo-p-dioxin (Carcinogen, Teratogen)
Thimerosal (Toxicant, Irritant)
Trichlorfon (Toxicant, Irritant)
Trinitrobenzylsulfonic acid (Toxicant, Irritant)

c) Physical agents (radiation, UV light, magnetic fields, lasers, noise, etc.).

Shepherd rodent irradiator (Irradiation)
OEC 9600 C-Arm (Radiation)
Siemens Arcadis C-Arm (Radiation)

2) **Experiment-Related Hazard Use** [*Guide*, pp. 18-19; See also Chapters 2 and 3 in *Occupational Health and Safety in the Care and Use of Research Animals*, NRC 1997].
Note: Written policies and standard operating procedures (SOPs) governing experimentation with hazardous biological, chemical, and physical agents should be available during the site visit.

a) Describe the process used to identify and evaluate experimental hazards. Describe or identify the institutional entity(ies) responsible for ensuring appropriate safety review prior to study initiation.

Hazards associated with research projects (bites, chemicals, radiation, allergens, zoonoses) are identified and evaluated by the AV, the IACUC, DLAR staff and Environmental Health and Safety Program staff through review of applications to the IACUC and the IBC.

b) Describe how risks of these hazards are assessed and how procedures are developed to manage the risks. Identify the institutional entity(ies) responsible for reviewing and implementing appropriate safety or containment procedures.

During the IACUC review process, potential hazards are identified. DLAR, with input from Environmental Health and Safety, has established SOPs for working with each hazardous agent category. If the agent described in the Animal Use Protocol falls under an already approved SOP, the Principal Investigator is required to reference that SOP in the AUP and follow the SOP in practice. If a unique hazard is identified, DLAR and Environmental Health and Safety generate an appropriate SOP prior to approval of the AUP.

c) Describe the handling, storage, method and frequency of disposal, and final disposal location for hazardous wastes, including infectious, toxic, radioactive carcasses, bedding, cages, medical sharps, and glass.

All carcasses, regardless of exposure to hazards, are incinerated as biomedical waste. Carcasses are stored in biohazard containers and collected weekly by a commercial contractor. Any infectious waste generated by experiments are stored and disposed in the same manner.

There are currently no experiments involving animals that generate radioactive waste. There have been no animal experiments involving the administration radioactivity within the animal facility in over 12 years. There is currently a single project where a radioactive agent is administered to mice as a terminal procedure in the PI's laboratory. The work is overseen by Radiation Safety and the animals do not return the animal facility.

Waste generated from the use of toxic agents are handled according to guidance from the EHS Chemical Safety Officer. Typically, the agents used are in such small amounts that caging and bedding can be handled under normal husbandry practices and disposed of normally. For certain agents, bedding may be collected and disposed of by EHS.

Glass and sharps are collected in sharps containers and disposed of by EHS.

d) Describe aspects of the medical evaluation and preventive health program specifically for personnel potentially exposed to hazardous agents.

OHSP Form A is completed by an individual's supervisor and reviewed by the OHSP staff prior to being cleared to work with animals. This form includes a matrix of potential hazards and exposure levels in a matrix. The OHSP personnel then determine what level of medical evaluation is appropriate.

3) **Hazardous Agent Training for Personnel** [*Guide*, p. 20]
Describe special qualifications and training of staff involved with the use of hazardous agents in animals.

Training on the potential hazards of working with animals and with hazardous agents that may be used during research on the animals begins with the orientation of personnel when they begin work. This includes a description of the facilities and types of hazardous agents that may be present at the time.
DLAR personnel are trained by their supervisor on the SOPs for the hazards in use in their area. During the IACUC review process, the Principal Investigator is provided with DLAR SOPs for each hazard they will be using. The PI is responsible for training his/her personnel and ensuring that they follow the DLAR SOP for each hazard.

4) **Facilities, Equipment and Monitoring** [*Guide*, pp. 19-20]

a) Describe locations, rooms, or facilities used to house animals exposed to hazardous agents. Identify each facility according to the hazard(s) and containment levels (if appropriate).
Note: If preferred, information may be provided in a Table or additional Appendix.

Mice are overwhelmingly the most commonly used species in research that involves hazards. Mice exposed to hazardous agents are housed in specific rooms within each animal facility (GSRC [redacted], SoM [redacted] and Discovery [redacted] Each of these areas is equipped with a negative pressure individually ventilated mouse rack and a biosafety cabinet.

Other species are exposed to hazardous agents less frequently. These are housed throughout the facility. Housing assignments are made on a case-by-case basis and the area is designated as a hazardous agent area by signage. Caging, biosafety cabinets, PPE, etc. are put in place in accordance with the SOP for that research hazard.

b) Describe circumstances and conditions where animals are housed in rooms outside of dedicated containment facilities (i.e., in standard animal holding rooms). Include practices and procedures used to ensure hazard containment.

Occasionally, species other than mice are exposed to hazardous agents. Rats and pigs may be exposed to viral vectors (lentivirus or adenovirus) and housed in conventional animal rooms. In these less common situations, each hazardous agent in use within the animal facility has a Standard Operating Procedure that describes the equipment and practices to be used with that particular agent. For rats, personnel protection is provided by appropriate PPE and biosafety cabinet use. For pigs, personnel protection is provided by appropriate PPE.

c) Describe special equipment related to hazard containment; include methods, frequency, and entity(ies) responsible for assessing proper function of such equipment.

Biosafety cabinets are certified annually by EHS contractors. The personal protective equipment used within the facility (gowns, respirators, gloves, etc) is disposable and does not require specific maintenance.

d) Describe the husbandry practices in place to ensure personnel safety, including any additional personnel protective equipment used when work assignment involves hazardous agents.

Researchers are required to notify the DLAR Supervisor prior to using hazardous agents in the animal facility. Animal care staff members do not directly handle hazardous chemical agents used in research projects; however, they may be involved in the handling of soiled bedding, animal carcasses, or other potentially contaminated materials. When that is the case, only trained staff members can handle the potentially contaminated materials. If new agents are introduced, the DLAR personnel are trained about the agent(s), the potential hazard, and the necessary precautions for working in the area as the need arises. Hands-on training on proper procedures is provided by supervisory personnel familiar with the agent(s), and new personnel are directly supervised until they are considered competent with the procedures by the DLAR Supervisor. Standard Operating Procedures specific to the agent are posted at the site where the animals are housed in order to provide additional guidance on handling procedures.

Hazardous agents currently in use do not require PPE beyond what is already used for conventional animal husbandry.

e) Incidental Animal Contact and Patient Areas

i) List and describe facilities that may be used for both animal- and human-based research or patient areas, including the policies and procedures for human patient protection, facility decontamination, animal transport through common corridors or elevators, and other personnel protection procedures.

No human patient areas are currently approved for animal use.

ii) Describe any *other* circumstances in which animals or caging equipment are transported in common use corridors or elevators (e.g., have the potential to come in contact with individuals not associated with the animal care and use program), and measures taken to mitigate risks associated with such use.

Rodents can be removed from DLAR in all three facilities and brought to researcher laboratories. These animals are transported on carts in covered microisolator cages. If animals exposed to hazardous agents are transported, the microisolator lids are taped or otherwise fixed to the cage bottom to prevent escape and/or contamination if the cart is toppled.

B. Program Oversight

1. The Role of the IACUC/OB [*Guide*, pp. 24-40]

a. IACUC/OB Composition and Function [*Guide*, pp. 17; 24-25]
Please provide a Committee roster, indicating names, degrees, membership role, and affiliation (e.g., Department/Division) as **Appendix 7**.

i. Describe Committee membership appointment procedures.

The IACUC is appointed by Harris Pastides, Ph.D., the University President. Potential members are suggested by the IO, the Vice President for Research, the IACUC Chair, the AV, department chairs, Deans, faculty, or the IACUC Administrator.

ii. Describe frequency of Committee meetings. Note that **Appendix 8** should contain the last two IACUC/OB meeting minutes.

Meetings are typically held monthly and additional meetings may be called by the IACUC Chair.

iii. Describe the orientation, training, and continuing education opportunities for IACUC/OB members. [*Guide*, p. 17]

Copies of relevant federal and state laws and regulations, guidelines, and institutional-specific policies are incorporated into an IACUC Members Notebook distributed to each committee member. New members meet with the Chair, veterinarian, and/or IACUC Administrator for orientation prior to beginning their term. Whenever possible, alternate members replace outgoing members on the committee. The alternates have then had an opportunity to observe and participate in IACUC activities before assuming a full member role. A didactic internet-based program describing IACUC function is required for all members. A portion of each IACUC meeting is devoted to training for members.

b. Protocol Review [*Guide*, pp. 25-27]

A blank copy of your institution's protocol review form should be provided as **Appendix 9**. Also include forms used for annual renewal, modifications, amendments, etc., as applicable.

i. Describe the process for reviewing and approving animal use. Include descriptions of how:

- the IACUC/OB weighs the potential adverse effects of the study against the potential benefits that may result from the use ("harm-benefit analysis"),
- protocols that have the potential to cause pain or distress to animals are reviewed and alternative methodologies reviewed,
- veterinary input is provided, and
- the use of animals and experimental group sizes are justified.

Note: Make sure you address each of the items above.

Requests for animal use are made by submitting an Animal Use Proposal (AUP) form to the IACUC via software accessible through the University website. De novo AUPs may either undergo Designated Member Review (DMR) or Full Committee Review (FCR). Amendments to approved AUPs may undergo Administrative Review (AR), Veterinarian Verification and Consult (VVC), DMR, or FCR.

The following situations require FCR:

1. De novo protocol involving procedures with pain and distress category E.
2. De novo protocol involving procedures with survival surgery.
3. De novo protocol involving procedures with USDA Species.
4. Changes that result in greater pain, distress, or invasiveness.

5. Change in housing and/or use of animals in a location that is not part of the animal program overseen by the IACUC (excluding field studies).

The following situations are eligible for DMR:

1. De novo protocols involving procedures with only pain and distress categories B, C and/or D.
2. Change in PI.
3. Change that impacts personnel safety.
4. Change in objectives, purpose, or aim of study.
5. Change to or addition of a species

Amendments meeting any of the following criteria are eligible for VVC:

1. Changes in euthanasia methods consistent with current AVMA Guidelines.
2. Changes in anesthesia, analgesia, or sedation in a manner published in peer-reviewed literature or textbook, such as Hawk's Formulary for Laboratory Animals (https://www.aclam.org/Content/files/files/Public/Active/formulary1-pref_abbrev_dose-est.pdf).
3. Changes in experimental substances and fundamentally similar compounds that are documented in the literature regarding safety and toxicity in the same species.
4. Less than 10% increase of any one species.
5. Change in stock, strain, or genetic modification, unless such change results in abnormalities that require special support or impact the scientific objectives of the study.
6. Change in previously approved procedures involving duration, frequency, type, or number of procedures performed on an animal, in accordance with commonly-accepted practices.

Amendments meeting any of the following criteria are eligible for AR:

1. Change in personnel other than the PI.
2. Change of protocol title.
3. Addition of new funding sources with no change in procedures
4. Correction of typographical errors, grammar, and contact information updates.
5. Change in IACUC-approved animal housing/procedure room.
6. Change in animal source involving a DLAR-approved vendor

For de novo AUPs and amendments eligible for DMR, all IACUC members are provided with a copy of the AUP and allowed a reasonable amount of time to request FCR. If no member requests FCR, then the AUP or amendment undergoes DMR.

DMR
The AUP or amendment is reviewed by the IACUC Chair, the Attending Veterinarian and one or more Designated Reviewer(s) who are assigned by the IACUC Chair. After reviewing the AUP or amendment, the reviewers may (1) approve the AUP or amendment, (2) require modifications to secure approval or (3), require FCR. If there is not a unanimous decision among the IACUC Chair, the Attending Veterinarian and the Designated Reviewer(s), the AUP or amendment is referred to the IACUC for FCR.

FCR
Two committee members are assigned as principal reviewers for each AUP or amendment. The principal reviewers present their analysis of the AUP to the committee at a convened meeting. All members are afforded the opportunity to comment and/or ask questions about the AUP or amendment. Members who cannot attend a meeting may relay questions or comments via the Chairperson, another committee member or via the electronic protocol system program. A quorum must be present at the meeting to vote on any recommended actions.

Following the committee review, the members may vote to (1) approve, (2) require modifications, or (3) withhold approval of the AUP or amendment. If by majority vote, the IACUC requires modifications to secure approval, the committee will (1) assign one or more members as designated reviewers for the modified AUP/amendment or (2) require FCR of the modified AUP/amendment.

The default process is for the modified AUP/amendment to be reviewed by a designated reviewer; however, any committee member, present or not, may request FCR of the modified AUP/amendment. If the IACUC uses a Designated Reviewer for the modified AUP/amendment, the IACUC Chair assigns one or more members who may (1) approve, (2) require additional modifications to secure approval, or (3) refer the AUP/amendment back to the IACUC for FCR. If more than one Designated Reviewer is assigned, the modified AUP/amendment is either approved unanimously by the Designated Reviewers or it must undergo FCR.

If the IACUC votes to withhold approval, the investigator may present a new AUP for de novo review.

VVC
For amendments eligible for VVC, the AV may (1) approve the amendment, (2) Require modifications to secure approval, or (3) refer the amendment to DMR or FCR, as appropriate.

AR

For amendments eligible for AR, the IACUC Administrator may (1) approve the amendment, (2) Require modifications to secure approval, or (3) refer the amendment to VVC, DMR or FCR, as appropriate.
Member attendance is documented and kept as part of the meeting minutes. A quorum is required for convening a meeting and voting on reviews or other business. A committee member who may have a conflict of interest on a specific AUP or amendment, e.g., Principal Investigator or Key Associate, is required to leave the meeting during review of that AUP and may not vote on the AUP.

All teaching or research activities that involve the use of animals require submission and approval of an Animal Use Proposal.

Information justifying the benefit/risk of the proposal in included in the lay summary and reviewed by the IACUC as previously described.

All submissions are reviewed by the Attending Veterinarian as part of the review process.

Records of meeting attendees are kept as part of the meeting minutes. A quorum is required for convening a meeting and conducting reviews. A committee member who may have a conflict of interest on a specific AUP, e.g., Principal or Associate Investigator, is required to leave the meeting during review of that AUP and may not vote on the AUP.

Any proposal where there is a potential for pain or distress is reviewed in the same manner as written in the above paragraphs. In addition to the two committee members, the attending veterinarian must also review the proposal. The investigator must include a statement in the Animal Use Proposal justifying the use of potential pain or distress in his/ her research. Every effort is made to find alternative procedures that will give the investigator the required results without causing pain or distress. The veterinarian is authorized to immediately stop procedures that may cause unnecessary severe pain or distress to the animals.

There is no change in the review process based on funding sources. All animal use for teaching or research requires submission and approval of the Animal Use Proposal.

ii. Describe the process for reviewing and approving amendments, modifications, and revised protocols. If applicable, include a description/definition of “major” vs. “minor” amendments.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Significant changes, such as change in study objective, animal number, animal species or strain, and/or change in procedure or surgery, are submitted to the IACUC via a software program, and complete copies are made available to each IACUC member. The proposed changes are reviewed as described above. The IACUC may approve the changes, require additional information to complete its review or require modifications (to secure approval).

Minor changes are reviewed by Veterinary Verification and Consult (VVC) or Administrative Review (AR) as described above. At any point, a review may be escalated to DMR or FCR as described above if there is any concern regarding the modification.

c. Special Considerations for IACUC/OB Review [*Guide*, pp. 5; 27-33]

i. Experimental and Humane Endpoints [*Guide*, pp. 27-28]

1) Describe the IACUC/OB's review of "humane endpoints," i.e., alternatives to experimental endpoints to prevent or in response to unrelieved animal pain and distress.

Specific humane endpoints are required on all proposals where the experiments may have adverse outcomes prior to the scheduled experimental endpoint. USC has an IACUC policy on humane endpoints as a reference to investigators. The specific endpoints, including monitoring intervals and personnel responsible for monitoring, are evaluated during the IACUC review of the proposal.

2) For studies in which humane alternative endpoints are not available, describe the IACUC/OB's consideration of animal monitoring and other means used to minimize pain and distress (e.g., pilot studies, special monitoring, other alternatives).

There are no models currently in use that do not have a set of predefined endpoint criteria. In such a situation, tentative endpoints would be used and the animals would be closely monitored for the development of pain or distress.

3) Identify personnel responsible for monitoring animals for potential pain and distress and describe any mechanisms in place to ensure that the personnel have received appropriate species- and study-specific training.

Both research staff and DLAR staff monitor animals for pain and distress. DLAR work assignments are made such that DLAR staff have experience and familiarity with the models under their care to facilitate monitoring.

ii. **Unexpected Outcomes that Affect Animal Well-being** [*Guide*, pp. 28-29]
Describe how unexpected outcomes of experimental procedures (e.g., unexpected morbidity or mortality, unanticipated phenotypes in genetically-modified animals) are identified, interpreted, and reported to the IACUC/OB.

Unanticipated adverse outcomes of experimental procedures are reported to the veterinary staff for evaluation. If the outcome requires a change in procedure, a change in pain/distress category, or other proposal alterations, the principle investigator will submit an amendment to the IACUC. The attending veterinarian is fully authorized to stop procedures in process and, if necessary, treat or euthanize animals as appropriate. Any such action would be reported to the IACUC.

iii. **Physical Restraint** [*Guide*, pp. 29-30]
Note: This section is to include only those protocols that require prolonged restraint. Brief restraint for the purpose of performing routine clinical or experimental procedures need not be described.

1) Briefly describe the policies for the use of physical restraint procedures or devices. Include, if applicable, the IACUC/OB definition of "prolonged."

The AUP form includes a requirement for the investigator to provide a valid scientific justification for the restraint, a thorough review of potential alternatives available, and a plan for monitoring the animals. In addition to monitoring by the PI, DLAR technicians observe animals during routine husbandry. The IACUC may require observation of the procedure by the veterinarian or DLAR manager.

Acclimation to some of the restraint methods currently in use is contraindicated as they are intended to induce stress.

2) Describe animal restraint devices that are used or have been used within the last three years. For each device, briefly describe
   - the duration of confinement
   - acclimation procedures
   - monitoring procedures
   - criteria for removing animals that do not adapt or acclimate, and
   - provision of veterinary care for animals with adverse clinical consequences.

Note: If preferred, this information may be provided in a Table or additional

Appendix.

Rodent restraint tube: Rodents are placed in the tube for up to one hour as a stress model. In some cases, the tubes are modified to allow microdialysis during the restraint. Acclimation is contraindicated as it would lessen its intended use as a psychogenic stressor.

There is a single protocol where mice are loosely restrained in a tube for 45 minutes after administration of a radioactive agent. In another protocol, mice are loosely restrained in a tube for 10 minutes while exposed to methacholine. In both cases, the animals are able to move within the tube. They are observed constantly throughout the procedure. Animals are not acclimated since they can move within the tube and do not appear to exhibit distress.

Panepinto slings: Panepinto slings are used to transport pigs and support them during cardiac ultrasound evaluation. They pigs are always anesthetized or heavily sedated when in the slings. They are never used in awake animals.

iv. **Multiple Survival Surgical Procedures** [*Guide*, p. 30]
Note: One survival surgical procedure followed by a non-survival procedure is not included in this category.

1) Describe the IACUC/OB's expectations regarding multiple survival surgery (major or minor) on a single animal.

The IACUC has a Policy on Multiple Major Surgical Procedures. Major surgery is defined as surgery that penetrates and exposes a body cavity or produces substantial impairment of physical or physiological functions (such as laparotomy, thoracotomy, craniotomy, joint replacement or limb amputation). Survival surgery is any surgical procedure in which the animal is allowed to recover from anesthesia.
Multiple major survival surgical procedures on a single animal are discouraged but may be permitted if scientifically justified by the user and approved by the IACUC. These procedures can be justified if they are related components of a research project, if they will conserve scarce animal resources, or if they are needed for clinical reasons. If multiple major survival surgery is approved, the IACUC will pay particular attention to animal well-being through continuing evaluation of outcomes. Cost savings is not adequate reason for performing multiple survival surgical procedures.

2) Summarize the types of protocols currently approved that involve multiple major survival surgical procedures

Note: If preferred, this information may be provided in a Table or additional Appendix.

1. 2257-100962-060115 Mice undergo partial carotid artery ligation. Several days later, a subcutaneous osmotic pump is placed.
2. 2268-100995-082615 Rats will undergo intracranial infusion followed by cranial cannula implantation three weeks later.
3. 2281-100965-121115 Swine will undergo occlusion of cardiac arteries (ligation or balloon catheter) followed by targeted cardiac injections 3-14 days.
4. 2307-101116-051816 Rats will have blood pressure transmitter implanted followed by implantation of an intracranial microwire array 14-21 days later.
5. 2313-101129-072916 Mice will have tumor cells transplanted in to the cecum followed by implantation of a subcutaneous implant 4 days later.
6. 2318-101144-090716 Rats will undergo a unilateral sciatic nerve crush followed by a sciatic nerve ligation one day later.
7. 2328-101171-121916 Mice undergo an intra-orbital injection under anesthesia followed by optic nerve crush two weeks later.
8. 2334-101180-022717 Mice will undergo intracranial injection followed by surgery to place a subcutaneous osmotic pump 6-weeks later.
9. 2344-101185-032817 Tumor cells will be surgically transplanted into the mammary glands of mice. When the tumors reach a specified size, they will be surgically removed.
10. 2347-101199-041717 Mice will undergo an ovariohysterectomy (or sham surgery) followed by viral electroporation OR implantation of a subcutaneous estrogen pellet two weeks later.
11. 2367-101253-071817 Mice will undergo multiple (up to six) intramuscular electroporations to maintain gene expression. Procedures will be performed two weeks apart.
12. 2373-101246-080217 Mice will undergo two intramuscular electroporations to maintain green expression. Procedures will be performed two weeks apart.
13. 2379-101225-083117 Rats will have subcutaneous osmotic pumps implanted followed by placement of indwelling jugular catheters 9-10 weeks later.

v. Food and Fluid Regulation [*Guide*, pp. 30-31]. *Note:* This does not include pre-surgical fast.

Summarize the types of protocols that require food and/or fluid regulation or restriction, including:

- justification
- species involved
- length and type of food/fluid regulation
- animal health monitoring procedures and frequency (e.g., body weight, blood urea nitrogen, urine/fecal output, food/fluid consumption)
- methods of ensuring adequate nutrition and hydration during the regulated period

Note: If preferred, this information may be provided in a Table or additional Appendix.

The IACUC has a policy on food/water restriction and the administration of medicated food/water. That policy outlines minimum monitoring an recordkeeping requirements. Below are all the currently approved AUPs that involve food or water restriction. Many are of short duration and do not require special monitoring. Only monitoring beyond what is required by IACUC policy is described here.

1. 2268-100995-082615 Rats have food held for seven hours to study food consumption following various treatments. Animals have access to food the remaining 17 hours/day and maintain normal body weight.
2. 2269-101023-083115 Food/water will be restricted for a period of up to 12 hours for food and up to 20 hours for water as part of a stress model. These two stressors will occasionally be simultaneously restricted, depending on how far along in the stress cycle the animals are. Food/water restriction is not repeated more than once every 48 hours. Food and water will be freely available throughout the rest of the period. Additionally, food and water are restricted as part of the sucrose preference test. Mice undergoing food or water restriction are weighed daily, and the weights will be recorded in a lab notebook and excel spreadsheet. As the goal of the chronic unpredictable mild stress procedure is to behaviorally-depress mice, and a "symptom" of depression is for the mice to lose weight (or not gain relative to the controls), a decrease in weight (relative to controls) is not expected and has not been observed. However, if a mouse's weight is less than 85% of that of the controls, the animal is removed from the study.
3. 2274-101041-100715 Mice will be fasted 5 hours prior to a glucose tolerance test. This will occur up to two times over 16 weeks.
4. 2278-101043-101615 Mice are food restricted for the social transmission of food preference (STFP). Fasting start (time/date) and fasting end (time/date) will be entered on the card. The animals are monitored daily and the restriction and feeding is monitored and

recorded. For the STFP experiment, mice are restricted for 23 hours and then have unlimited access to food for 1 hour/day. This regimen will occur for 3-5 days in a row, depending on the timing of the retrieval test (i.e., 3 days in a row if the memory is to be tested 7+ days following training, 4 days in a row if memory is to be tested 24 hours after training). For the 7+ day retrieval tests only, mice undergo food restriction for a second period of 3 days for testing (2 days prior to testing and the testing day itself). Mice always have access to water. Immediately following testing, animals are returned to ad libidum access to food. Mice are weighed prior to starting food restriction and daily thereafter. If a mouse loses >20% of their body weight, they are removed from the study.

5. 2280-101048-111115 Mice are fasted 14-16 hours prior to glucose tolerance testing and 5-6 hours prior to insulin tolerance testing. The mice will have access to water during the fasting.
6. 2288-101084-020516 For evaluation of executive function, rats are placed on a food restriction schedule (with ad lib water) to adapt them to the feeding regimen used during behavioral testing. The animals are initially restricted to 21 g/day of chow. Animals are monitored daily during testing for changes in body weight and motivation. Animals exhibiting a pattern indicative of low motivation have their daily allotment of food reduced by 1-3 grams as needed. Animals exhibiting a decrease in body weight will receive an additional 1-3 g of chow per day. All modifications to daily food intake are made by individuals unaware of the treatment conditions of the individual animals. On days when behavioral testing is conducted (Sunday-Friday), the amount of food received via the food rewards in the task (Noyes pellets) is subtracted from the animals' daily allotment. Animals are given 3 hours immediately after testing to consume the remainder of their food allotment. On non-testing days, animals are given 5 hours to eat their daily portion. All rats are weighed and handled daily as part of the testing procedure. Maximal body weight loss will be 15% (85% normal weight). Greater body weight loss or adverse clinical signs will be cause for a return to ad lib feeding.
7. 2289-101081-021016 Mice are fasted for 7 hours prior to exercise or nutrition (liquid AIN-76 diet) stimulus at the end of the study. Animals remain fasted after the acute stimulus (exercise or liquid AIN-76 diet) for 3 or 10 hours until sacrificed depending on the treatment group. During this time animals will have free access to water.
8. 2295-101100-032416 Mice are fasted for 6 hours prior to blood glucose and insulin sensitivity measurements.
9. 2302-101109-051016 Food will be withheld for 24 hours prior to colonoscopy. Animals will have access to water.

10. 2307-101116-051816 Rats have food and water withheld for 7 hours prior to sucrose preference testing. Unrestrained accesses to water and 1% sucrose is then made available to the rats for a period of 12 hours. Bottles will be weighed before and after and the amount of fluid consumed from each bottle will be recorded. A baseline sucrose preference is conducted 3 days before the start of defeat or control and again 24 hours and 5 days after the final experimental exposure. Depending on the study, the sucrose preference test may be conducted up to 4 times with at least 4 days in between each test over a 3-week period.
11. 2311-101094-072516 Mice are deprived of water for up to seven hours followed by access to two water bottles, one with purified water and the other with a 2% sucrose solution, for twelve hours. According to the sucrose preference test, this will occur twice, once for habituation and again for the actual test. This test will not be repeated more than once per week for each mouse.
12. 2324-101167-120116 Mice will be food-restricted for operant training. This will involve limiting food intake to three pieces of chow per day (in addition to the food they consume during the self-administration session). The three food pellets will be provided after the daily operant session. Food restriction will last a minimum of 7 and no more than 30 days. Every animal will be exposed to only a single interval of food restriction. Mice will not be water-restricted. Mice are weighed daily while food restricted and ad libitum access to food is restored if an animal's body mass falls below 90% of that measured prior to initiation of food restriction. Rats will be will be deprived of water for 7 hours prior to sucrose preference testing. Each animal participating in the test will undergo one period of water deprivation. Rats evaluated for sucrose self-administration will be restricted to 20g of food per day, beginning one day before the first raining session and continued throughout training. Water is available ad libitum for these rats. Rats evaluated for cocaine self-administration may be exposed to a no longer than 5-day period of food deprivation (20g of food/day) to motivate cocaine seeking. Animals will be removed from the study if: 1) weight loss of 10% or greater from baseline; 2) inability to move around the cage; 4) dehydration (determined by delayed skin tenting); 4) labored breathing; 5) tumor of any size; 6) neurologic signs (e.g seizures); 7) behavioral abnormalities (e.g failure to groom, lethargy, hunched posture).
13. 2326-101166-121516 Animals undergoing the glucose tolerance test are fasted for 14-16 hours, insulin tolerance test and signaling studies for 5-6 hrs. Animals are maintained without food for 5-6 hours for the acute exercise study.

14. 2347-101199-041717 Mice will be fasted for 5 hours prior to blood collection to measure various metabolic parameters. Animals will have access to water during this time.
15. 2348-101184-041917 Mice will be fasted for 5 hours prior to blood collection to measure various metabolic parameters. Animals will have access to water during this time.
16. 2349-101211-041917 *Peromyscus spp.* are fasted for 16 hours prior to a single blood glucose measurement. Animals have access to water during this time.
17. 2350-101201-042017 Mice will be pair fed for up to 20 weeks, i.e., one mouse will be
18. food restricted to the level of a mouse fed ad libitum.
19. 2354-101194-051217 Mice are fasted for 7 hours prior to exercise at the end of the study. Animals remain fasted after the acute stimulus for 3 or 10 hours until sacrificed depending on the treatment group. During this time animals have free access to water.
20. 2355-101205-051517 Mice have food withheld for 12 hours prior to administration of an agent to induce colitis. Animals have access to water during this time.
21. 2362-101221-053117 Mice have food withheld for 24 hours prior to implantation of tumor cells into the colon.
22. 2374-101258-080217 Mice are pair fed, i.e., one mouse has daily food allotment based on daily food consumption of another mouse.
23. 2389-101244-101317 Rats tested in operant chambers are restricted to 21 g/day of soy-free chow. Animals are monitored daily during testing for changes in body weight and motivation. Animals exhibiting a pattern indicative of low motivation will have their daily allotment of food reduced by 1-3 grams as needed. Animals exhibiting a decrease in body weight will receive an additional 1-3 g of chow per day. All modifications to daily food intake are made by individuals unaware of the treatment conditions of the individual animals. On days when behavioral testing is conducted (Sunday-Friday), the amount of food received via the food/sucrose rewards in the task (Noyes pellets) is subtracted from the animals' daily allotment. Animals are given 3 hours immediately after testing to consume the remainder of their food allotment. On non-testing days, animals are given 5 hours to eat their daily portion.

    Rats undergo sucrose habituation prior to testing in the operant chamber. Animals will have the choice to drink form one of 5 different bottles, containing either 0,1,3,10 or 30% w/v sucrose for one hour on each of two testing days in their home cages. Specially marked graduated water bottles are used to record water and sucrose consumption. Regular water bottles are removed from the home cages at 7PM with testing to begin at 10AM the following morning. Total fluid consumption (water + sucrose) per test day should not decrease relative to non-restricted 24-hour consumption. Rats will either be food or water restricted, but not both simultaneously.. Maximal body weight loss will be 15% (85% normal weight). Greater body weight loss or adverse clinical signs (lethargy, severe dehydration) will be cause for removal from the study.

24. 2390-101282-101317 Rats are administered medicated water from 10 AM to 6PM daily. They will not have access to unmedicated water during this time. Body weights and total water consumption are recorded daily.
25. 2399-101260-111717 Mice are fasted overnight from 9pm to 9am (in a cage with a wire floor to prevent access to feces) to empty the colon for a procedure. This occurs twice per animal.
26. 2401-101292-112817 Mice are fasted for 6 hours prior to oral gavage with an imaging agent. This occurs once per animal.
27. 2402-101304-112917 Mice are fasted for 4-6 hours with free access to water prior to intraperitoneal glucose tolerance test. Following completion of the test (2 hours), food is provided to the mice. This occurs up to three times per mouse.
28. 2409-101321-031918 Rats are food-restricted (to approximately 85% of free-fed weight) for up to three months for behavioral studies.

vi. Use of Non-Pharmaceutical-Grade Drugs and Other Substances [*Guide*, p. 31]

Describe the IACUC/OB's expectations regarding the justification for using non-pharmaceutical-grade drugs or other substances, if applicable.

The IACUC has a policy that whenever available, pharmaceutical grade drugs and substances must be used. When nonpharmaceutical agents are proposed, the PI must provide scientific justification and provide details of the preparation. Cost savings alone is not an applicable justification.

vii. Field Investigations [*Guide*, p. 32]

Describe any additional considerations used by the IACUC/OB when reviewing field investigations of animals (non-domesticated vertebrate species), if applicable.

The AUP form has a section that must be completed for field studies. It requires the Principal Investigator to provide copies of permits and proof of legal access to the property. The PI must indicate whether the study is capture/release, capture/nonsurvival, etc. and answer specific questions related to the type of study they indicate. Required information includes how animals will be treated if they become injured, how personnel will be trained, personnel safety and descriptions of any procedures performed.

viii. Animal Reuse [*Guide*, p. 5]

1) Describe institutional policies regarding, and oversight of, animal reuse (i.e., on multiple teaching or research protocols).

Animals are not reused in research projects. Research naïve animals may be transferred to other protocols provided that the receiving AUP contains that species.

2) Briefly describe the types of activities currently approved that involve the reuse of individual animals.
Note: A list of specific protocols involving reuse of animals should be available during the site visit.

N/A

3) Describe other instances where the final disposition of animals following study does not involve euthanasia, including adoption, re-homing, rehabilitation, etc.
Note: A list of specific protocols involving reuse of animals should be available during the site visit.

N/A

2. Post-Approval Monitoring [*Guide*, pp. 33-34]

a. Describe mechanisms for IACUC/OB review of ongoing studies and periodic proposal/protocol reviews (e.g., annual, biennial, triennial, or other frequency).

Animal Use Proposals are approved for a maximum of three years. Prior to the first and second anniversaries of approval, the IACUC requires the investigator to submit an annual update for IACUC review. If the investigator fails to provide the Annual Update or the IACUC requires additional information to complete the review, further animal use is deferred until the review is completed by the IACUC. If a project is to continue beyond three years, the investigator must file a new Animal Use Proposal for IACUC review with an additional section for description of work already accomplished. The three-year renewal is reviewed in the same manner as a new proposal.

b. Describe the process and frequency with which the IACUC/OB reviews the program of animal care and use.

The IACUC conducts semiannual program review through a subcommittee appointed by the IACUC Chariman (including any members who specifically request to participate) using the current NIH Semiannual Program Review Checklist as a template.

c. Describe the process and frequency with which the IACUC/OB conducts facility and laboratory inspections.

- Describe the rationale or criteria used for exempting or varying the frequency of reviewing satellite holding facilities and/or animal use areas.
- If contract facilities or contractor-provided personnel are used, describe procedures used by the IACUC/OB to review such programs and facilities.

Note: A copy of the last report of these reviews should be included as **Appendix 10.**

The IACUC inspects all of the institution's animal facilities, including satellite facilities, using the Guide as a basis for evaluation twice a year at six-month intervals. The IACUC procedures for conducting semiannual facility inspections are: Subcommittees are appointed by the IACUC Chairman (including any members who specifically request to participate) to conduct inspections of animal facilities using the NIH Sample Semiannual Facility Review Checklists and the Guide as references. The inspection includes all animal housing areas and service areas, surgery facilities, and animal procedure areas of investigators' laboratories. No areas are exempted from inspections.

d. If applicable, summarize deficiencies noted during external regulatory inspections within the past three years (e.g., funding agencies, government, or other regulatory agencies) and describe institutional responses to those deficiencies. *Note:* Copies of all such inspection reports (if available) should be available for review by the site visitors.

None to report

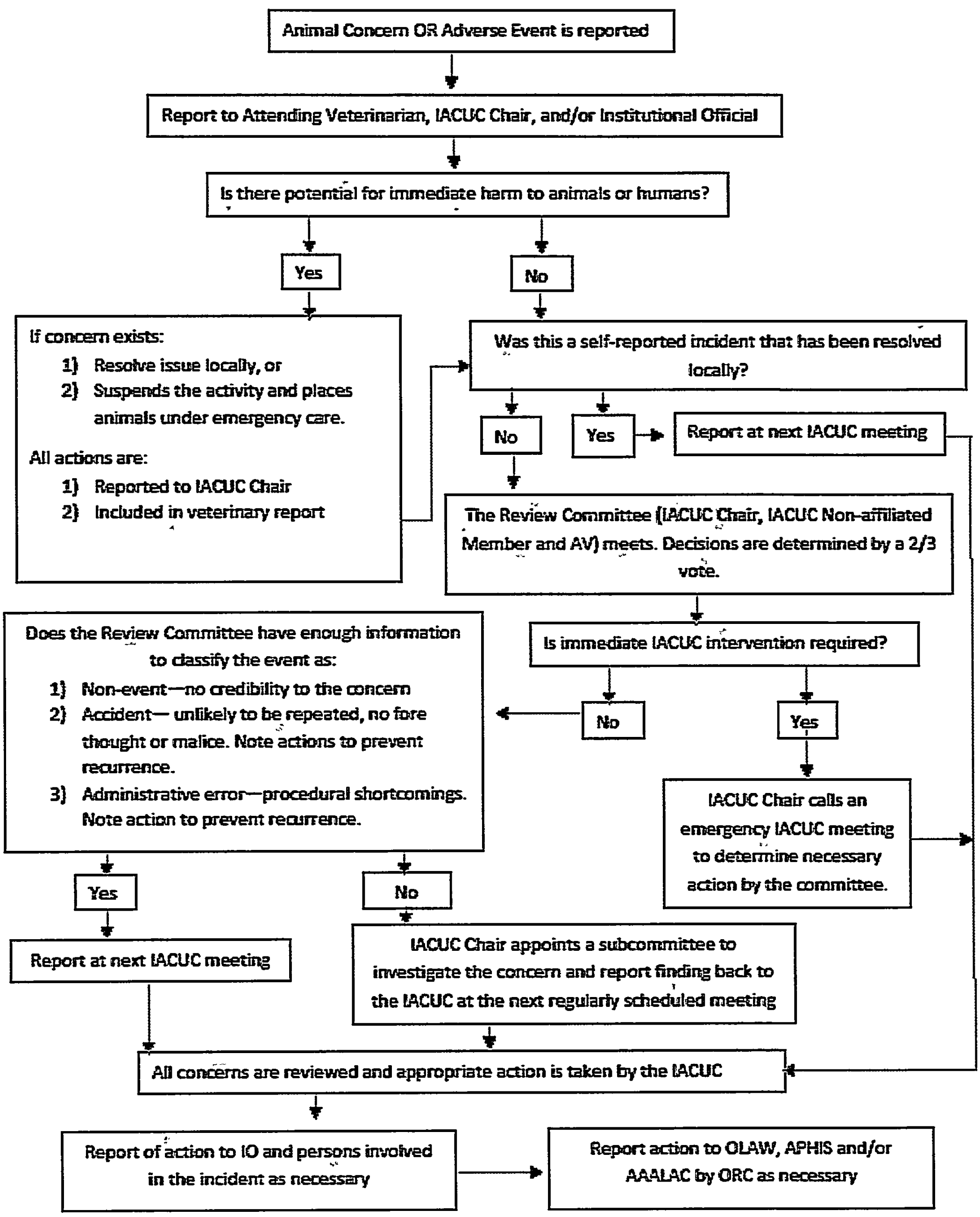
e. Describe any other monitoring mechanisms or procedures used to facilitate ongoing protocol assessment and compliance, if applicable.

The IACUC has a written policy on post approval monitoring (PAM). It includes passive processes such as annual AUP reviews, semiannual facility and laboratory inspections and the daily observations of the animals by husbandry staff. It also includes an active component that focuses on projects that involve surgical procedures, animals in USDA Category E, USDA-covered species, laboratories with past compliance concerns or laboratories designated by the IACUC or the AV. In addition, protocols are randomly selected for regulatory audits by the IACUC Administrator.

3. Investigating and Reporting Animal Welfare Concerns [*Guide*, pp. 23-24]

Describe institutional methods for reporting and investigating animal welfare concerns.

The USC IACUC has a policy describing the reporting and investigation process for animal welfare concerns. Any faculty member, student, staff member, or other individual who feels that animal misuse may have occurred has an obligation to report their concern to the veterinarian in charge of USC's animal facilities. Alternatively, reports should be made to the chairman or some other member of the USC IACUC. Concerns may be reported in writing and signed (preferred by IACUC) or anonymously. Persons may informally consult with the veterinarian, chairman or a committee member prior to initiation of a formal report.
The process for investigating concerns is illustrated by the following flow chart:


Investigation of Concerns:

Animal Concern OR Adverse Event is reported
Report to Attending Veterinarian, IACUC Chair, and/or Institutional Official
Is there potential for immediate harm to animals or humans?
Yes
No
If concern exists:
1) Resolve issue locally, or
2) Suspends the activity and places animals under emergency care.
All actions are:
1) Reported to IACUC Chair
2) Included in veterinary report
Was this a self-reported incident that has been resolved locally?
No
Yes
Report at next IACUC meeting
The Review Committee (IACUC Chair, IACUC Non-affiliated Member and AV) meets. Decisions are determined by a 2/3 vote.
Does the Review Committee have enough information to classify the event as:
1) Non-event—no credibility to the concern
2) Accident— unlikely to be repeated, no fore thought or malice. Note actions to prevent recurrence.
3) Administrative error—procedural shortcomings. Note action to prevent recurrence.
Is immediate IACUC intervention required?
No
Yes
IACUC Chair calls an emergency IACUC meeting to determine necessary action by the committee.
Yes
No
Report at next IACUC meeting
IACUC Chair appoints a subcommittee to investigate the concern and report finding back to the IACUC at the next regularly scheduled meeting
All concerns are reviewed and appropriate action is taken by the IACUC
Report of action to IO and persons involved in the incident as necessary
Report action to OLAW, APHIS and/or AAALAC by ORC as necessary

4. **Disaster Planning and Emergency Preparedness** [*Guide* p. 35]
Briefly describe the plan for responding to a disaster potentially impacting the animal care and use program:

- Identify those institutional components and personnel which would participate in the response.
- Briefly describe provisions for addressing animal needs and minimizing impact to animal welfare.

Note: A copy of disaster plan(s) impacting the animal care and use program must be available for review by the site visitors.

A disaster plan has been developed and incorporated into the University's disaster planning process. Emergency personnel, such as USC law enforcement retain a copy of the disaster plan. Excess food, water, and clean bedding is held in reserve to maintain animals in the event of a prolonged interruption, typically because of inclement weather. All DLAR veterinary and care staff are considered essential personnel and must report to work if they are able to safely do so in a disaster.

II. Animal Environment, Housing and Management

Note: Complete each section including, where applicable, procedures performed in farm settings, field studies, aquatic environments, etc.

A. Animal Environment

Note: Facility-specific details regarding mechanical system construction and operation is requested in Section IV.B.5. and **Appendix 11**; current (measured ***within the last 12 months***), detailed (by room) performance data must also be provided as indicated in **Appendix 11.**

1. Temperature and Humidity [*Guide*, pp. 43-45]

a. Describe the methods and frequencies of assessing, monitoring, and documenting that animal room or housing area temperature and humidity is appropriate for each species.
Note: If preferred, this information may be provided in a Table or additional Appendix.

Performance is monitored in real time by two redundant systems through DLAR and USC Facilities:

1. DLAR monitors animal room temperature, humidity, and light cycles with a computerized environmental monitoring system (Rees Scientific). The system monitors and records these parameters in real time from the DLAR office. It can provide printouts of the high, low, and average temperature and humidity of rooms. If the system detects levels outside the set parameters, there is an automatic alert to senior DLAR personnel.
2. USC Facilities monitors HVAC function through a computerized Johnson Controls system ("Metasys"). This is independent of the DLAR system described above. If supply temperatures deviate outside of preset

parameters, USC Facilities personnel and senior DLAR personnel are notified.

b. List, by species, set-points and daily fluctuations considered acceptable for animal holding room temperature and relative humidity.
Note: If preferred, this information may be provided in a Table or additional Appendix. [*Guide*, pp. 44 and 139-140]

The following table shows the standard set points for each species. Occasionally, the nature of research projects require a different temperature. Our facilities do not have centralized humidity control; rather, humidity is indirectly maintained by supply air temperature and air flow. Portable humidifiers/dehumidifiers are available for use when necessary. Variation in temperature from set point is expected to be less than 2°F. Wider fluctuations result in the alarming of the Metasys temperature monitoring system and automatic notification of key USC Facilities personnel and senior DLAR personnel so that the problem can be investigated and resolved.

Species	Temperature Set Point (degrees F)
Mice	70
Rats	70
Peromyscus	70
Gerbils	70
Hamsters	70
Guinea Pigs	70
Swine	72

c. Temperature set-points in animal housing rooms and/or environmental conditions are often outside of the species-specific thermoneutral zone. Describe the process for enabling behavioral thermoregulation (e.g., nesting material, shelter, etc.) or other means used to ensure that animals can control their thermoregulatory environment. Include a description of IACUC/OB approved exceptions, if applicable. [*Guide*, p. 43]

Rodents are often housed at temperatures below what is currently believed to be their thermoneutral zone. Rodents are provided with contact bedding and social housing to maintain their desired microenvironmental temperatures. Mice and *Peromyscus spp.* are also provided with nesting material and/or shelters.

2. Ventilation and Air Quality [*Guide*, pp. 45-47]

a. Describe the methods and frequencies of assessing, monitoring, and documenting the animal room ventilation rates and pressure gradients (with respect to adjacent areas).

Note: If preferred, this information may be provided in a Table or additional Appendix.

The HVAC system performance in all 3 animal facilities is monitored redundantly through a computerized REES system maintained by DLAR and through a Johnson Controls "Metasys" system maintained by USC Facilities.

Animal Care Technicians also use experience to note any unusual environmental conditions such as a build-up of odor. If there are unusual findings the supervisor is notified, and the appropriate maintenance personnel are called in. Actual room ventilation rates and pressure gradients are checked by the Industrial Hygienist in EHS, by an outside contractor, or by Physical Plant personnel triennially. If there is a perceived problem, the evaluation can be done as needed, e.g., for diagnosis or following repairs or maintenance.

b. Describe ventilation aspects of any special primary enclosures using forced ventilation.

BioBubble flexible film cubicles are located in several rooms at the School of Medicine. These cubicles provide a HEPA-filtered, positive pressure environment for housing animals.
Both Discovery and the GSRC each have three rooms containing 5 permanent cubicles. Each cubicle is individually ventilated and exhausted and can be either positive or negative relative to the room.
All three animal facilities contain positive pressure, individually-ventilated rodent cages manufactured by Allentown, Inc. and positive or negative pressure, individually-ventilated rodent cages manufactured by Techniplast.

c. If any supply air used in a room or primary enclosure is recycled, describe the percent and source of the air and how gaseous and particulate contaminants are removed.

There is no recirculation of animal room air.

3. Life Support Systems for Aquatic Species [*Guide*, pp. 84-87]

a. Provide a general description of institutional requirements for enclosures using water as the primary environmental medium for a species (e.g., aquatics).

The IACUC has adopted a written policy on the requirements for aquatic animal housing. Deviations from this policy must be justified and approved by the IACUC. From that policy:

A life support system refers to the physical structure used to contain water and house animals, as well at any ancillary equipment used to move and/or treat water. The type of life support system should be appropriate for the intended use. The selection and/or design of a life support system should be based on the natural habitat of the species, age/size of the species, number of animals maintained, availability and characteristics of the water required, and the type of research.

Most aquatic animals are poikilothermic and depend on the temperature of their environment to sustain physiologic processes. Temperature should be controlled at the appropriate level and monitored daily. If temperature falls outside the appropriate range, a monitoring and reporting plan should be in place such that the person responsible for the animals and/or DLAR is notified immediately. The volume of water contained in a room can affect room temperature, temperature stability, and relative humidity. Air handling systems must be adequate to compensate for these thermal and moisture loads.

Aquatic species are often sensitive to changes in photoperiod, light intensity, and wavelength. Light-dark cycles should be appropriate to support normal physiological function.

Aquatic species may be sensitive to noise and vibration transmitted through the water. Effects of noise and vibration may be present but subclinical.
If noise and vibration are evident the system must be modified, placed on isolation pads, or moved to another location.

b. Provide a general description of overall system(s) design, housing densities, and water treatment, maintenance, and quality assurance that are used to ensure species appropriateness.
Note: Facility-specific tank design and parameter monitoring frequencies should be summarized in **Appendix 12** (Aquatic Systems Summary).

The IACUC has adopted a written policy on the requirements for aquatic animal housing. Deviations from this policy must be justified and approved by the IACUC. From that Policy:

Space recommendations and housing density vary extensively with the species, age, and size of the animals, the life support system and the type of research. The needs of each situation must be evaluated by the IACUC in consultation with the Principle Investigator to determine appropriate housing space. Advice from outside experts may be indicated.

Water quality parameters and life support systems for aquatic animals will vary with the species, life stage, total biomass supported, and the animals' intended use. Characteristics that may affect the appropriateness of water quality include temperature, pH, alkalinity, nitrogen waste products, phosphorus, chlorine/bromine, oxidation-reduction potential, conductivity, salinity, hardness, dissolved oxygen, total gas pressure, ion and metal content, and the established microbial ecology of the tank. Appropriate water quality characteristics must be recorded daily. Written and/or electronic records must be available at the housing site for IACUC inspection at all times. Recirculating systems are strongly preferred over static/renewal systems. The use of static/renewal systems for fish species must be scientifically justified.

Housing must meet the following criteria:

- Allow for the normal physiological and behavioral needs of the animals, including excretory function, control and maintenance of body temperature, normal movement and postural adjustments, and, where applicable, reproduction. In some poikilothermic reptiles and amphibians, microenvironmental temperature gradients may be needed for certain physiologic functions such as feeding and digestion.

- Allow conspecific social interactions (i.e., schooling in fish species).

- Provide a balanced, stable environment that supports the animals' needs.

- Provide the appropriate water quality and characteristics, and permit monitoring, filling, refilling and changing of water.

- Allow access to adequate food and allow removal of food waste.

- Restrict escape or accidental entrapment of animals or their appendages.

- Be free of sharp edges and/or projections that could cause injury.

- Allow for observation of the animals with minimal disturbance.

- Be constructed of nontoxic materials that do not leach toxicants or chemicals into the aquatic environment.

- No present electrical hazards.

Food should be stored in a type-appropriate manner to preserve nutritional content, minimize contamination, and prevent entry of pests. The animal room should be regularly cleaned and disinfected. Animals must receive daily care from qualified personnel who have sufficient understanding of the housing system to identify malfunctions and, if they are unable to address a system failure of such magnitude that it requires resolution before the next workday, access to staff who can respond to the problem.

4. **Noise and Vibration** [*Guide*, pp. 49-50]
   Describe facility design features and other methods used to control, reduce, or prevent excessive noise and vibration in the animal facility.

   All animal facilities have been constructed in the basement or lowest floors of their buildings to provide a physical separation from common or high traffic areas. The designs within the facilities also provide reduced noise and vibration from the cage wash facilities through a physical separation from animal holding rooms and labs. Noise and vibration from racks, carts, and other equipment is controlled through regular maintenance or replacement of parts that may generate noise or vibration.

B. Animal Housing (all terrestrial, flighted, and aquatic species)

1. **Primary Enclosures**
   Note: A description of primary enclosures used (e.g., cages (conventional, individually-ventilated cage systems (IVCS), etc.), pens, stalls, pastures, aviaries, tanks) should be included in **Appendix 13**.

   a. Describe considerations, performance criteria and guiding documents (e.g. *Guide*, *Ag Guide*, ETS 123 and/or other applicable standards) used by the IACUC/OB to verify adequacy of space provided for all research animals, including traditional laboratory animal species, agricultural animals, aquatic species, and wildlife when reviewing biomedical, field and agricultural research studies.

   All currently approved projects are classified as "biomedical" research and The Guide for the Care and Use of Laboratory Animals is used as the primary guiding document. The Animal Welfare Act and Regulations are followed for USDA-covered species. In instances where there is conflict between the two sets of guidelines and regulations, the strictest would be followed.

   b. Describe space exceptions to the guiding documents (*Guide*, *Ag Guide*, ETS 123, and/or applicable standards), indicating the references, considerations and performance criteria used (e.g., by the IACUC/OB) to verify adequacy of space provided for all animal species covered by the program. [*Guide*, pp. 55-63]

   Trio mating of poorly-breeding mice of is sometimes used to increase number of successfully weaned pups. This exception requires IACUC review and approval. Cages are checked daily by DLAR staff and are changed if the cages become excessively soiled or odorous. The strains of mice typically have very small litters and no problems have been observed with this practice.

2. **Environmental Enrichment, Social, and Behavioral Management** [*Guide*, pp. 52-55; 63-65: *Ag Guide*, Chapter 4]

a. **Environmental Enrichment**

i. Describe the structural elements of the environment of primary enclosures that may enhance the well-being of animals housed (e.g., resting boards, privacy areas, shelves/perches, swings, hammocks).

Species	Resting Boards	Shelves/ Perches	Toys /Manipulanda	Foraging Opportunities	Nesting Material	Other
Pig			X			Group housing of compatible animals.
Mouse					X	Group housed and bedding material provided unless stated otherwise in the protocol. "Mouse houses", tubes, or other forms of enrichment may be provided.
Peromyscus					X	Group housed and nesting material provided unless stated otherwise in the protocol. Plastic or paper "mouse houses" or tubes may be provided.
Rat			X		X	Group housed unless stated otherwise in the protocol.
Guinea Pig					X	Group housing. Hay is fed for enrichment.
Hamster					X	Group housing when the protocol allows.

ii. Describe nonstructural provisions to encourage animals to exhibit species typical activity patterns (e.g., exercise, gnawing, access to pens, opportunity for exploration, control over environment, foraging, denning, burrowing, nesting materials, toys/manipulanda, browsing, grazing, rooting, climbing).

Rodents are provided with contact bedding of sufficient depth to allow digging and burrowing. Mice are provided with nesting material, such as Neslets, that allow natural nest building. Rats are provided with nylon bones/toys for chewing. Pigs are provided with sanatizable toys.

b. **Social Environment** [*Guide*, p. 64]

i. Describe institutional expectations or strategies for social housing of animals.

Animals are group housed as appropriate. The Principal Investigator must justify individual housing for social animals when completing the Animal Use Protocol.

ii. Describe exceptions to these expectations (e.g., veterinary care, social incompatibility) and other typical justification approved by the IACUC/OB for housing animals individually.

Animals are typically individually housed post-operatively, especially in projects involving external modifications such as cranial cannulas, headcaps, etc. to prevent disruption of the surgical site and equipment. Pigs may be housed individually but have tactile, olfactory, visual and auditory contact with other pigs.

iii. Describe steps taken with isolated or individually housed animals to compensate for the absence of other animals (interaction with humans, environmental enrichment, etc.).

When pigs individually housed, they are allowed tactile, olfactory, visual and auditory contact with other pigs in the room. In the unlikely event that there was only one pig, the caretaker would spend extra time with the animal providing contact such as scratching or petting.

c. **Enrichment, Social and Behavioral Management Program Review** [*Guide*, pp. 58, 69]
Describe how enrichment programs and exceptions to social housing of social species are regularly reviewed to ensure that they are beneficial to animal well-being and consistent with the goals of animal use.

All AUPs are reviewed annually. Exemptions to the IACUC Environmental Enrichment Policy are re-evaluated as part of that process.

d. **Procedural Habituation and Training of Animals** [*Guide*, pp. 64-65]

Describe how animals are habituated to routine husbandry or experimental procedures, when possible, to assist animals to better cope with their environment by reducing stress associated with novel procedures or people.

For rodents, procedural habituation is not commonly performed. Swine are acclimated to human contact through a variety of actions such as gentle talking, administration of treats, and petting to facilitate future calm interactions with staff.

e. Sheltered or Outdoor Housing [*Guide*, pp. 54-55]

i. Describe the environment (e.g., barn, corral, pasture, field enclosure, flight cage, pond, or island).

The only outdoor facility is located at the Baruch Field Station (Georgetown, SC). At that site there is a 3000 square foot building used for seawater tables and tanks for marine animals. The building is screened, with no air conditioning or heating.

ii. Describe methods used to protect animals from weather extremes, predators, and escape (windbreaks, shelters, shaded areas, areas with forced ventilation, heat radiating structures, access to conditioned spaces, etc.).

The outdoor facility at Baruch is covered and screened.

iii. Describe protective or escape mechanisms for submissive animals, how access to food and water is assured, provisions for enrichment, and efforts to group compatible animals.

When fish are housed in the outdoor Baruch facility, they are housed only with the same species in tanks large enough for submissive animal to avoid contact with other fish. For some species, hides are provided as appropriate.

f. Naturalistic Environments [*Guide*, p. 55]

i. Describe types of naturalistic environments (forests, islands) and how animals are monitored for animal well-being (e.g., overall health, protection from predation).

Not applicable.

ii. Describe how food, water, and shelter are provided.

Not applicable.

iii. Describe how animals are captured.

Not applicable.

C. Animal Facility Management

1. Husbandry

a. Food [*Guide*, pp. 65-67]

i. List type and source of food stuffs.

Commercial laboratory animal diets are used as the primary food types. They are obtained from Sinclair, Inc., Florence, South Carolina. Sinclair is an authorized dealer for Teklad laboratory animal feeds. These may be supplemented with items such as fruit, hay, liver, or canned cat and dog foods as needed by the particular species and situation. Specialty items are purchased from other vendors on an as needed basis.

Standard Diets:
Teklad Irradiated Rodent 8904
Teklad Mini Swine 7037
Teklad Irradiated Global 18% Rodent Diet w/Fenbendazole TD.01432I

Non-Standard Diets provided by the PI (or DLAR when requested) when approved by the IACUC:
Teklad Rodent 2920
Teklad Rodent 2020x
Purina Rodent Irradiated 5058

Synthetic, semi-synthetic, or medicated diets are obtained as needed from Dyets, BioServe, Harlan Teklad, or Purina

ii. Describe feed storage facilities, noting temperature, relative humidity, and vermin control measures, and container (e.g., bag) handling practices, for each of the following:

- vendors (if more than one source, describe each)
- centralized or bulk food storage facilities if applicable
- animal facility or vivarium feed storage rooms
- storage containers within animal holding rooms

Sinclair, Inc. stores laboratory animal feeds in a separate warehouse. The warehouse is an insulated metal building on a sealed concrete slab. Feed is stored on raised pallets. Food is received and sold within a two to three week period. Milling dates are checked by Sinclair personnel on receipt and prior to delivery to the university. The delivery truck is cleaned after each delivery. Vermin control consists of monthly treatment to the outside perimeter of the building, primarily to control ants, and the use of sealed rodent baits as needed within the building.

All food is delivered to and stored at the GSRC. Bags are inspected at the time of delivery, and torn, wet, or unsatisfactory bags are rejected. Food is stored in the dedicated feed storage room on tubular aluminum racks approximately 14" off the floor. The room is maintained at 70°F. The GSRC feed room also has a 6' x 10' walk-in cooler maintained at 45-50°F for storage of special diets.

Supplies for other facilities are delivered to the School of Medicine and Discovery from GSRC weekly. There is no long-term storage at these facilities.

At the School of Medicine food is stored on aluminum racks in a walk-in cooler at 45-55°F. There is also a chest freezer which is dedicated to storage of specialty diets.

At Discovery, food is stored in the dedicated feed storage room on tubular aluminum racks approximately 14" off the floor. The room is maintained at 70°F. A 6' x 3' cooler is maintained at 45-50°F for storage of special diets.

Non-volatile roach baits and rodent traps are available for use if indicated. There is no insecticide use in the animal facility. University maintenance personnel provide monitoring devices for the building interior and insect control around the outside perimeter of buildings if requested.

Covered plastic bins are used to maintain animal dietw

iii. Describe special food preparation areas, such as feedmills and locations where special diets are formulated, if applicable. Include in the description sanitation and personnel safety practices (noting that respiratory protection is described in Section 2.I.A.2.b. ii. Standard Working Conditions and Baseline Precautions above).

There is no diet preparation area. We do not grind or mix medicated or other feeds. These types of feeds are purchased from commercial manufacturers of specialty products such as synthetic or semi-synthetic diets.

iv. Describe how food is provided to various species (*ad libitum*, limited amounts, types of feeders).

Rodents: ad lib in feeders in the wire cage tops or slotted feeders attached to the cage side.

Pigs: a daily ration of pig feed sufficient to maintain growth and conditioning is fed in stainless steel door-mounted "J" feeders.

v. Describe special food quality control procedures including procedures for rotating stock, monitoring milling dates, nutritional quality, bio load, chemical contaminants, etc.

Feed deliveries are scheduled approximately every two weeks to avoid stockpiling and help ensure that fresh feed is on hand. Laboratory feeds are dated to allow milling date monitoring. Bags are visually inspected at delivery, and torn or soiled bags are rejected. Feed is stored with the milling date visible and used on a first in - first out basis. Stacks of bags are labeled for first use.
When bags of feed are opened, the feed is transferred to plastic bins. The bins are labeled with the type of diet, milling date, and date the feed was placed in the barrel.
Autoclaved diets are made up as needed for use within 1 week. Autoclaved diets are not stored in quantity.
Routine microbiological and/or chemical analysis of food is not performed.

b. Drinking Water [*Guide*, pp. 67-68]

i. Describe the water source, treatment or purification process, and how it is provided to the animals (e.g., bowls, bottles with sipper tubes, automatic watering, troughs, ponds, streams).

Source: City of Columbia water system.
At GSRC and Discovery, municipal water is treated by an Edstrom reverse osmosis system and stored in an Edstrom reservoir. From the reservoir, the water is piped to a bottle filler for rodents and directly to automatic watering valves for swine.

At the School of Medicine city water is filtered and provided without further treatment unless there is a request for special treatment by the investigator.

At any facility, rodents may be provided hyperchlorinated/acidified water that is prepared by the animal care staff. Distilled, deionized, and autoclaved sterile water are also available by bottle, at the request of the investigator.

How provided: Unless a protocol is specifically approved for water restriction, all animals have access to water ad libitum. All rodents are provided water by bottle with a sipper tube on the cage. Pigs are provided with automatic waterers.

ii. Describe methods of quality control, including monitoring for contaminants.

The City of Columbia provides a water analysis report semiannually. There is also a quarterly newsletter. The report is made available to investigators upon request. Water samples are collected quarterly within the animal facilities for bacterial analysis through a contract laboratory.

iii. If automatic water delivery systems are used, describe how they are maintained and sanitized.

Automatic watering is only used for swine housed within the GSRC. The Edstrom system automatically flushes the lines with sodium hypochlorite then rinses with water daily.

c. Bedding and Nesting Materials [*Guide*, pp. 68-69]

i. Describe type(s) and how used for various species.

Bedding
Shepherd SSP Alpha-Dri Plus ADP – Rodents, contact bedding
Teklad Sanichip 7090a – Rodents, contact bedding
Tecklad Irradiated Corn Cob 7907

Enrichment
Ancare Nestlets – Rodents, enrichment
Bed R'Nest – Rodents, enrichment

ii. Describe bulk bedding storage facilities, if applicable, including vermin control measures.

The GSRC serves as the main receipt and storage area for bedding. Bags are inspected on arrival to insure their integrity and cleanliness. They are stored in the clean storage area on tubular aluminum pallets approximately 14" off the floor.
At the School of Medicine and Discovery, bedding is stored on pallets in the clean storage room. Only amounts that can be used within about 2 weeks are kept on hand. Supplies are drawn from the GSRC stock.

iii. Describe quality control procedures, including monitoring for contaminants.

Bags of bedding are visually inspected on arrival and when drawn from storage. If torn, badly soiled, or bags with evidence of contamination or infestation are found, they are rejected or destroyed.
Microbiological testing or chemical analysis on bedding is not routinely performed.

d. Miscellaneous Animal Care and Use Equipment

i. Describe motorized vehicles and other equipment (e.g., trailers) used for transporting animals, noting the type and how the cargo compartment is environmentally controlled, if applicable.

Two vehicles are assigned to DLAR.
Ford custom animal transport van (2013) - used for transporting animals. The passenger cab and the animal compartment are physically separated and have independent HVAC systems. The animal compartment is cleaned and sanitized between shipments of animals.
Chevrolet Step-van (1998) equipped with a power lift - used for transporting supplies and equipment between facilities. The cargo area is cleaned and disinfected between loads.

ii. Describe other animal care related equipment used in the animal care program (specialized equipment for exercise or enrichment, high pressure sprayers, vacuum cleaners, tractors, trailers, spreaders, etc.).

HEPA-filtered changing stations – 28
Manual floor scrubber/buffer - 2
High pressure washer - 1
Wet/dry vacuum cleaner - 1

e. Sanitation [*Guide*, pp. 69-73]

i. Bedding/Substrate Change

1) Describe frequency of contact and non-contact bedding change for each species and enclosure type (solid-bottom or suspended) or pen.

Mouse, solid bottom – static cages: minimum 2X/week, IVC cages: minimum 1X/week
Rats, solid bottom - static cages: minimum 2X/week, IVC cages: minimum 1X/week
Peromyscus, solid bottom – minimum 2x/wk
Pig, pen – slotted pens are cleaned twice daily

2) Describe any IACUC/OB approved exceptions to frequencies recommended in the *Guide* or applicable regulations and the criteria used to justify those exceptions.

There are no currently approved exceptions to the recommendations in the Guide. Cage changing may be delayed for rodents with newborn litters, but cages are monitored to assure that they are not exceptionally wet or dirty.

3) Note the location where soiled bedding is removed from the cages/enclosures and where clean bedding is placed into the cages/enclosures.

Soiled bedding is removed from rodent cages in the "dirty" side of the cage wash at each facility. A HEPA-filtered bedding dump station is used to protect personnel. Soiled bedding is placed in plastic bags for removal to a dumpster for pickup by USC contracted personnel. Clean cages are bedded on the clean side of the cage wash area.

ii. **Cleaning and Disinfection of the Micro- and Macro-Environments**
Note: A description of the washing/sanitizing frequency, methods, and equipment used should be included in **Appendix 14** (Cleaning and Disinfection of the Micro- and Macro-Environment) and **Appendix 15** (Facilities and Equipment for Sanitizing Materials).

1) Describe any IACUC/OB approved exceptions to the *Guide* (or applicable regulations) recommended sanitation intervals.

None

2) Assessing the Effectiveness of Sanitation and Mechanical Washer Function

a) Describe how the effectiveness of sanitation procedures is monitored (e.g., water temperature monitoring, microbiological monitoring, visual inspections).

Rinse water temperatures on all tunnel and rack washers are set to reach at least 180°F. All tunnel and rack washers have automatic alarm features that stop the machines if the temperature is below 180°F. The rack and tunnel washers also have a printout feature that shows the temperatures.
Technicians also use temperature indicators (Temp-tape 180, Pharmacal) attached directly to cages.
Microbiological monitoring is performed monthly on equipment and cages from each washer.

b) Describe preventive maintenance programs for mechanical washers.

At each facility, the tunnel washers, rack washers, and autoclaves are maintained under a preventive maintenance/service contract with a private contractor.

f. Conventional Waste Disposal [*Guide*, pp. 73-74]
Describe the handling, storage, method and frequency of disposal, and final disposal location for each of the following:

i. Soiled bedding and refuse.

Soiled bedding is emptied into double layered plastic bags and placed in an outside dumpster. Dumpsters are emptied daily by USC contracted personnel. Bedding potentially contaminated with hazardous agents is collected by Environmental Health and Safety. EHS has a controlled area for storage until transfer to a licensed medical waste hauler for incineration.

ii. Animal carcasses.

GSRC: Animal carcasses are placed in plastic bags.
If the animal is to be necropsied, it is placed in a walk-in cooler in the necropsy room. Animals for disposal are placed in the freezer in the service corridor. Carcasses in bags are placed in plastic lined boxes in the walk-in freezer for disposal. Personnel from Environmental Health & Safety label and seal boxes and transport them to a controlled area until transfer to a licensed medical waste hauler for incineration.
School of Medicine: Animal carcasses are bagged in plastic bags and placed in lined boxes in a chest freezer inside the dock area until they are picked up by personnel from Environmental Health & Safety. If requested by PI, carcasses of animals found dead can be placed in a small refrigerator in a procedure room. The animals are kept for 48 hours after the PI is notified. If not claimed, they are disposed of as described above.
EHS has a controlled area for storage until transfer to a licensed medical waste hauler for incineration.
Discovery: Animal carcasses are bagged in plastic bags and placed in a freezer located in the necropsy/procedure room. The carcasses are collected daily by DLAR personnel and transported to the GSRC for disposal as previously described.

g. Pest Control [*Guide*, p. 74]

i. Describe the program for monitoring and controlling pests (insects, rodents, predators, etc.). Include a description of:
- monitoring devices and the frequency with which devices are checked
- control agent(s) used and where applied, and

- who oversees the program, monitors devices, and/or applies the agent(s).

Pest control consists primarily of exclusion of pests. There is no insecticide use in the animal facility. Rodent traps (live traps) may be used if there is an escaped animal from the colony.

Insecticides may be used outside of animal areas in areas such as building perimeters. The insecticide is usually diazanon spray that is applied by university grounds personnel.

ii. Describe the use of natural predators (e.g., barn cats) or guard animals (e.g., dogs, donkeys) used for pest and predator control, if applicable.

Not applicable

iii. Note how animal users are informed of pesticide use and how animal users may opt out of such use in specific areas.

Should the use of pesticides become necessary, the investigators with animals in the area would be individually notified by DLAR and the specifics for use or for moving animals would be discussed with them before any pesticide application.

h. Weekend and Holiday Animal Care [*Guide*, pp. 74-75]

i. Describe procedures for providing weekend and holiday care. Indicate who (regular animal care staff, students, part-time staff, etc.) provides and oversees care and what procedures are performed.

Animal facilities are covered continuously throughout the year whether or not the university is officially open, and animals are observed daily. Members of the regular animal care staff perform animal health and welfare inspections and basic animal care duties on all weekends and holidays. The weekend/holiday technician is on call from 5:00 PM on Friday to 8:00AM Monday and is provided with a cell phone. Duties include animal inspection, environmental monitoring, and animal maintenance for animals requiring feed and water or bedding. The Attending Veterinarian is accessible by phone 7 days a week, 24 hours a day. The veterinarian, manager, and supervisors are on a rotating roster to provide management oversight. A member of the supervisory staff is on call at all times and carries a department cell phone to facilitate contact if the animal technicians note any problems. For animals with special needs, e.g., post-operative medications, the supervisory staff member is responsible for making rounds and treatments if required. For longer holidays and weekends, the manager assigns adequate personnel to assure full care of the animals. The USC Police Department has a roster of the supervisory personnel for notification in case of an emergency. Contact numbers are prominently posted in each animal facility.

ii. Indicate qualifications of weekend/holiday staff if not regular staff.

All weekend/holiday staff are regular staff.

iii. Describe procedures for contacting responsible animal care and/or veterinary personnel in case of an emergency.

There is always a veterinarian and/or animal care supervisor on call for consultation and response to emergencies. The senior personnel (Attending Veterinarian, Facility Manager, and Building Supervisors) have cellular telephones. Cell phone numbers for emergency contacts are posted in each animal facility. The veterinarian and supervisors' office, cellular, and home telephone numbers are included in the USC Police notification procedures.

2. Population Management [*Guide*, pp. 75-77]

a. Identification

Describe animal identification methods for each species (e.g., microchips, cage/tank cards, collars, leg bands, tattoo, ear tags, brands).

Rodents: When animals are received or transferred, a cage card containing animal number, strain, investigator, protocol number, source, date received, sex, weight, and special comments is prepared by DLAR and placed on the cage.

Investigators may add additional data cards when treating individual animals or groups of animals during experiments. These cards are the responsibility of the investigator.

Individual rodents may be marked by ear punch, inks, or dyes by the investigator. There is one protocol currently approved for toe clipping.

DLAR personnel may assist the investigator with animal identification such as ear punching.

Swine: Ears are notched by the vendor (Palmetto Research Swine). Plastic ear tags are used for pigs on long term studies.

b. Breeding, Genetics, and Nomenclature

i. Describe the program for advising investigators on the selection of animals based on genetic characteristics.

DLAR maintains a reference library for investigators to provide information on genetic characteristics. Information on available stocks or strains from sources such as The Jackson Laboratory is provided to investigators through the DLAR newsletter or by direct contact with investigators. Requests for information on breeding and genetics are handled by direct consultation with the investigators.

Investigators desiring to maintain a breeding colony are required to submit a Breeding Animal Use Proposal to the IACUC. The IACUC reviews the breeding scheme, selection of replacement animals, and methods for evaluating the genotype.

ii. Describe the program for advising investigators on using standardized nomenclature to ensure proper reporting of the identification of the research animals with regard to both the strain and substrain or the genetic background of all animals used in a study.

When completing the AUP, the PI is required to select the mouse stain from a drop-down menu. The database supplying that list is generated by DLAR and contains standardized nomenclature when established for that strain. Primary responsibility for designating nomenclature of genes, genetic manipulation (knock-out, transgenics), or sublines is with the investigator maintaining the colony.

General information on standardized nomenclature is provided in DLAR newsletters, etc., and specific problems may be handled by direct consultation with investigators. Investigators maintaining breeding colonies submit a Breeding Protocol that includes information on strain, specific genetic characteristics, and nomenclature. When investigators maintain their own breeding colonies, they are responsible for maintaining the breeding records and designating the nomenclature for any lines, sublines or GEM they produce.

Nomenclature for *Peromyscus* is handled by the *Peromyscus* Advisory Committee and the principal investigator. Extensive records on *Peromyscus* are maintained by the PI.

iii. Describe genetic management techniques used to assess and maintain genetic variability and authenticity of breeding colonies, including recordkeeping practices (*Guide*, pp. 75-76).

Authenticity of breeding colonies and maintenance of genetic variability is the responsibility of the PI. Record keeping practices may be reviewed as part of the AUP submission process.

iv. For newly generated genotypes, describe how animals are monitored to detect phenotypes that may negatively impact health and well-being. Note that the methods used to report unexpected phenotypes to the IACUC/OB should be described in section 2.1.B.1.c.ii, "Unexpected Outcomes that Affect Animal Well-Being."

The Principal Investigator is required to complete a section of the AUP on anticipated phenotypes of newly generated genotypes. This information is updated and reviewed annually. Animals are observed daily and deleterious phenotypes are reported utilizing a Sick Animal Report as described in subsequent sections. The IACUC, PI and AV would decide on a course of action.

III. Veterinary Care [*Guide*, pp. 105-132]

Note: Complete each section, including, where applicable, procedures performed in farm settings, field studies, aquatic environments, etc.

A. Animal Procurement and Transportation [*Guide*, pp. 106-109; *Ag Guide*, pp. 8; 45; 50-57]

1. Animal Procurement

Describe the method for evaluating the quality of animals supplied to the institution (from commercial vendors, other institutions, etc.).

Rodents: Animal procurement is centralized in DLAR, and DLAR advises investigators on commercial sources of animals. Only SPF animals are purchased from commercial vendors. Vendor health surveillance data for the major suppliers are regularly reviewed. The number of vendors used is kept to a minimum to reduce the likelihood of introducing diseases. Vendors commonly used are Envigo Laboratories, Charles River Laboratories, Taconic, and The Jackson Laboratory. Where there are multiple colonies, DLAR may specify the plant and in some cases the colony room.

Transgenic rodents are sometimes imported from other institutions. This process includes direct consultation with a staff member at the sending institution, evaluation of the supplier and review of the supplier's animal health surveillance records before allowing shipment, followed by quarantine at GSRC, and extensive laboratory evaluations that may include serology, bacteriology, parasitology, and histopathology before animals are allowed into the general animal population.

USC is the genetic resource for *Peromyscus spp*. and new stocks are occasionally offered from colonies at other institutions. The same procedures for importation as those for other rodents are used, with additional testing for Hantavirus and Borrelia.

Swine: Swine are obtained from Palmetto Research Swine (Reevesville, South Carolina) and from Valley Brook Farm (Madison, Georgia). Swine are purchased as needed for specific procedures and held as a group until used. To the extent possible, new animals are not introduced into existing groups.

2. **Transportation of Animals**
Describe how animals are transported between outside sources and the institution and within the institution, including loading, unloading, level of biosecurity, immune status and specific pathogen status (consider all species, including aquatic and semi-aquatic species).

Rodents are delivered by the vendor's truck or sent via air to Columbia and delivered to the facility by commercial van. In some cases, DLAR personnel pick up animals at the airport for transport to the GSRC for quarantine.

Pigs are delivered by the vendor in a climate-controlled truck.

When rodents are moved between animal facilities, the DLAR animal transport vehicle is used. Veterinary approval must be obtained before animals are moved between DLAR facilities.

Within facilities rodents may be moved from the animal facility to research laboratories on carts.

B. Preventive Medicine

1. Animal Biosecurity [*Guide*, pp. 109-110]

a. Describe methods used to monitor for known or unknown infectious agents. Note that if sentinel animals are used, specific information regarding that program is to be provided below.

Health reports from commercial vendors are posted online and regularly reviewed by DLAR. Only animals from approved vendors and barriers can be ordered by faculty.
For animals received by interinstitutional transfer, health reports are required of prior to being accepted into quarantine. Animals delivered without prior health approval or a health report will not be accepted into the facility.
A quarterly health surveillance system is in place for all rodents. Sentinel animals are exposed to dirty bedding from colony animals during cage changes. After approximately 8 weeks, necropsies are performed on the sentinels to observe for macroscopic and microscopic lesions. The animal is inspected for internal and external parasites and samples are submitted for serologic or PCR examination for exposure to viral and bacterial pathogens.

b. Describe methods used to control, contain, or eliminate infectious agents.

Upon receipt the shipping boxes for all small animal species are decontaminated using Halo disinfectant solution. Shipping containers are also not opened until they reach their assigned animal room and are ready to be placed in cages.

Additional steps are taken to prevent cross contamination between animals by requiring that gloves be decontaminated with a Halo disinfectant solution between each opening each cage and through the use of individually assigned cleaning equipment, feed bins, etc. for each animal room.

When infectious agents are detected in a colony the room is quarantined. Those animals are serviced last and appropriate PPE is required to enter the room. Depending on the nature of the research and the specific pathogen, the colony may be depopulated, treated, or maintained in quarantine until the conclusion of the study.

2. Quarantine and Stabilization [*Guide*, pp. 110-111]

a. Describe the initial animal evaluation procedures for each species.

Rodents from commercial vendors with a history of supplying to DLAR are received at the GSRC where shipping containers are checked for damage, the outside of the box is decontaminated, and paperwork is checked to assure correct delivery. In hot weather or when there is any question about the delivery vehicle, the temperature and condition of the delivery vehicle are checked and noted. If the commercial containers are not damaged and there is no evidence that the animals may be compromised, the containers are moved from the clean dock to the receiving room where the animals are placed in cages, or held for transport to other permanent housing locations (School of Medicine or Discovery) via the animal van.

Rodents from new sources or from institutions with no DLAR history are received at the GSRC and placed in quarantine according to the DLAR procedures for importation of new animals. A dirty bedding system is used to expose contact bedding sentinels to infectious agent in the imported mice. They are also tested for endo- and ecto- parasites and possibly undergo other laboratory evaluations as needed prior to entering USC colonies.

Pigs are delivered to the GSRC by the vendor. They are housed in one of two rooms that serve as quarantine, stabilization, and permanent housing.

b. Describe quarantine facilities and procedures for each species. For each species, indicate whether these practices are used for purpose-bred animals, random-source animals, or both.

Rodents: Rodents from approved commercial sources, e.g., Envigo Taconic, Jackson Laboratories, or Charles River Laboratories, for which quality control data are available, are not quarantined. If there is no evidence of disease or abnormality, they may be placed in an animal room with others of the same species, source, and health status. Rodents from other sources i.e., other universities, are placed in quarantine. Their dirty bedding is exposed to immunocompetent animals during cage changes for approximately 8 weeks, at which time the sentinels are evaluated for endo- and ectoparasites and samples are submitted to a contract laboratory for evaluation of exposure to viral and select bacteriologic agents. While in quarantine, the imported animals are treated for endo- and ectoparasites.

Rats: Rats are only received from approved colonies from commercial vendors and are not quarantined.

Swine: Groups of purpose bred pigs are delivered by the vendor and inspected by DLAR staff upon arrival. Pigs scheduled for survival surgery or long-term experiments are given a course of antibiotics to minimize the impact of opportunistic respiratory pathogens that are endogenous in farm pigs.

c. Describe the required/recommended stabilization period for each species.

Rodents: Investigators are advised to allow newly procured rodents to stabilize and acclimate for at least 3 days before beginning experimental procedures.
Peromyscus: New peromyscus are held for varying lengths in quarantine depending on their health status before they are allowed into the colony.
Swine: Pigs are held for 24-48 hours for acute procedures and 5 days for chronic studies.
Other: Other species that are infrequently used are handled on a case by case basis.
Fish used at the Baruch Institute are wild-caught and are not quarantined or acclimated.

3. Separation by Health Status and Species [*Guide*, pp. 111-112]

a. Describe the program for the separation of animals by species, source, and health status. If the animals in different status are not maintained separately, describe circumstances in which mixing occurs and explain the rationale for mixing.

With the exception of *Peromyscus*, species are not mixed in animal rooms. Several species of the genus *Peromyscus* are housed in the same room; however, these are very closely related species and compatible.
To the extent possible, animals from different sources are not placed in the same room. There may be specific instances when rodents from more than

one vendor may be housed together in the same room if the medical history is known and surveillance results indicate similar health status. Separation by health status is maintained. By policy, rats, mice, and other rodents are procured from breeders with a record of good quality, and from which health reports are regularly available.

b. Describe situations where multiple species may be housed in the same room, area, or enclosure.

Several species of the genus *Peromyscus* are housed in the same room; however, these are very closely related species and compatible. They have been co-housed in the same room for decades without issue.

c. Describe isolation procedures and related facilities for animals.

Over 95% of the animals held are rodents. Health problems are usually handled as a herd problem, and the entire colony or room becomes the isolation area. Procedures for personnel entry, PPE, and husbandry are implemented for the entire room. Individual animals with noninfectious problems are treated in the home cage or colony room to maintain social and psychological well-being. Isolation of large animals is possible at the GSRC when deemed necessary by the veterinarian; however, dedicated animal isolation rooms are not designated.

C. Clinical Care and Management [*Guide*, pp. 112-115]

1. Surveillance, Diagnosis, Treatment and Control of Disease [*Guide*, pp. 112-113]

a. Describe the procedure(s) for daily observation of animals for illness or abnormal behavior, including:

- the observers' training for this responsibility
- method(s) for reporting observations (written or verbal)
- method(s) for ensuring that reported cases are appropriately managed in a timely manner.

Daily observation by DLAR is three-tiered. The first level is the animal husbandry technician who cares for the animals. They observe animals during feeding or cage changing, and they check all animals daily, including weekends and holidays. Animal technicians are trained one-on-one with their supervisor, complete online training, and may have ALAT certification. The second level is the supervisor for the area who receives reports from the technicians and makes checks on the rooms during daily animal care. All supervisors have LATg certification. Both written and verbal communications are used to notify a superior of a problem. A written "Sick Animal Report" is initiated by the first person who observs the animal, and the cage is marked for easy identification by the investigator, supervisor, or veterinarian. Sick animal reports are ultimately turned in to the DLAR veterinary technician, who may treat the animal, contact the PI, and/or contact the veterinarian as appropriate.

b. Describe methods of communication between the animal care staff and veterinary staff and the researcher(s) regarding ill animals.

DLAR is a small department and communication among staff, veterinarians, researchers and research staff is most often verbal and in person. Email and telephone communication are also used in instances where the involved parties do not enter the vivarium daily.

c. Describe the preventive medicine and health management/monitoring programs (e.g., physical examination, TB testing, vaccination, hoof/nail trimming, teeth cleaning/floating, vendor surveillance, use of sentinel animals) for each species.

Rodents: Vendor surveillance files are reviewed for each vendor. All animals are procured by DLAR, and only SPF animals are purchased from commercial vendors. DLAR has a policy on importation of rodents that are obtained from other than commercial sources (other universities). A health profile is required for evaluation before giving permission to ship animals. A complete evaluation of the animals that may include pathology, serology, bacteriology, and/or parasitology is required before animals are released from quarantine. A system by which sentinel animals are exposed to dirty bedding is utilized quarterly for monitoring for colony exposure to adventitial agents.

Swine: Pigs are vaccinated for common diseases at the sole supplier (Palmetto Research Swine). Pigs are examined at the time of arrival by DLAR staff. Pigs used in chronic procedures may treated with a course of antibiotics to minimize the impact of subclinical respiratory infection on arrival.

2. Emergency Care [*Guide*, p. 114]

a. Describe the procedures to ensure that emergency veterinary care is continuously available for animals during and outside of regular work hours, including access to drugs or other therapeutics and equipment.

Cell phone numbers for the Attending Veterinarian and Facility Manager are posted in multiple locations in every facility. For veterinary emergencies, the veterinarian and/or veterinary technician will have access to any necessary drugs, therapeutics, and equipment.

b. Describe the authority of the Attending Veterinarian or his/her designee relative to the emergency treatment of animals in the program.

The Attending Veterinarian has the full authority to initiate any appropriate emergency treatment and to immediately stop procedures that may cause unnecessary pain or distress to the animals.

3. Clinical Record Keeping [*Guide*, p. 115]

a. Describe the procedure for maintaining medical records and documenting treatment of ill animals including: clinical laboratory findings, diagnoses, treatments, medical progress records, etc. Identify the species for which individual records are maintained and where such records are kept.

For species that require individual health records, such as swine, the health record is initiated upon receipt of the animal by the receiving DLAR personnel. The active records are maintained in or near the animal holding room and all medical progress including clinical findings, diagnoses, and treatments are recorded as they occur by the individual addressing the progress. After the animal is euthanized, the health record is stored in the DLAR office.
Technicians observing abnormities in these animals will submit a Sick Animal Report to the veterinary technician or area supervisor. All findings or veterinary care stemming from the Sick Animal Reports are documented in the animal health record.
For rodents and other animals for which individual health records are not maintained, a Sick Animal Report is initiated as abnormal observations are made by the personnel first identifying the sick animal. All findings, diagnosis, and treatments for these animals will be documented on the Sick Animal Reports as described above. Sick Animal Reports will be maintained after final disposition by the veterinary technician.

b. Identify individual(s) (titles, not necessarily names) responsible for maintaining such records and identify where the records are maintained and who, including the IACUC/OB has access to the records.

For species that require individual health records, such as swine, the record is initiated upon receipt of the animal by the receiving DLAR personnel. They are maintained by all personnel who work with the animals.
Sick Animal Reports are initiated by any individual identifying a potentially sick animal. They are submitted to the veterinary technician who manages the case until its resolution.

c. Describe the role of the Attending Veterinarian in recordkeeping.

The AV has access to all medical records and sick animal reports and is ultimately responsible for their maintenance and retention.

4. **Diagnostic Resources.** Describe available diagnostic methods used in the program including:

   a. In-house diagnostic laboratory capabilities.

   The DLAR diagnostic laboratory is located in the GSRC. Capabilities include basic hematology and differential blood counts, bacteriology for animals and equipment monitoring, parasitology, and blood chemistries. Equipment includes chemical hood, laboratory microscopes, centrifuges, and other routine laboratory equipment.

   b. Commercially provided diagnostic laboratory services.

   DLAR contracts with veterinary diagnostic laboratories for sentinel animal examination. The facilities at the IDEXX BioResearch/Research Animal Diagnostic and Investigation Laboratory and BioReliance are used. DLAR also uses the South Carolina Animal Diagnostic Laboratory located in Columbia for definitive bacteriology and antibiotic sensitivity testing and other diagnostic tests.

   c. Necropsy facilities and histopathology capabilities.

   There is a fully equipped necropsy facility in the GSRC which includes down-draft necropsy table, walk-in cooler, walk-in freezer, and euthanasia equipment. The South Carolina Animal Diagnostic Laboratory provides histopathology support and diagnosis. There is also scanning and electron microscope support through the School of Medicine.

   d. Radiology and other imaging capabilities.

   DLAR has a Min X-ray 80+ unit with table located in the surgery suite. Support for film developing and storage is provided through an agreement with the Student Health Center. The unit is certified by Health and Safety Programs Unit annually when in use. It is currently not in use and has been disassembled and stored.

   A C-arm fluoroscope is present is a shielded room in the GSRC surgical area. Multiple large animal and rodent ultrasound units are available.

5. Drug Storage and Control

a. Describe the purchase and storage of controlled and non-controlled drugs.

Supplies of controlled drugs purchased by DLAR are stored in a double locked steel cabinet in a locked room in the DLAR office. Small supplies for immediate use can be stored in a locked narcotics safe in the surgery pack prep/supply room ([redacted] DLAR controlled drugs are for use by DLAR personnel only. DLAR does not provide controlled substances to investigators or their laboratories. Each investigator that uses controlled substances in his or her work is required to obtain appropriate licensure and is responsible for maintaining their controlled substances according to state and Federal law.

Some drugs are stored in the DLAR laboratory and lab refrigerator ([redacted] The DLAR animal health technologist uses a coding system to mark the expiration dates on drugs.

b. Describe record keeping procedures for controlled substances.

Controlled substance invoices are filed with orders in the locked cabinet. When a drug is received, a record is created in a log book. Information for each utilization of that agent, dose, volume, animal ID, etc, is entered on that record.

D. Surgery [*Guide*, pp. 115-123]

1. Pre-Surgical Planning [*Guide*, p. 116]

Describe the process(es) used to ensure adequate pre-surgical planning, including: identifying personnel; locating equipment, supplies, veterinary involvement for selecting analgesic and anesthetic agents and facilities; planning; and pre- and post-operative care.

The IACUC reviews plans for surgical procedures as a part of the proposal review. The Animal Use Proposal contains a section for surgical procedures that includes description of the procedures for animal preparation, anesthesia, analgesia, surgery, and postsurgical monitoring, as well as a listing of personnel who will conduct surgery and their qualifications.

All non-rodent survival surgical procedures are carried out in the DLAR surgical suite located in the GSRC. Before any procedures, the DLAR technical staff works with the investigator to determine the types and quantity of equipment and instruments, anesthesia, and post-operative care that the animals will need. DLAR maintains basic surgical support equipment, instrument packs, and ancillary support items such as fluids and gown and glove packs. Specialized instruments are the responsibility of the investigator. DLAR personnel are available for assistance as circulating nurse/anesthetist or surgical assistant depending on the needs of the surgeon(s).

Rodent surgery may be conducted in laboratories provided a specific space is designated and prepared in accordance with the Guide recommendations.

2. **Surgical Facilities** [*Guide*, pp. 116-117, 144-145]
   List building name(s) and room number(s) or other locations (coded, if confidential) where surgical procedures are performed. For each, describe:
   - the type of species (including rodents, fish, agricultural species, etc.)
   - nature of procedure(s) (major/minor/emergency, survival and non-survival, etc.)
   - the amount of use [heavy (daily), moderate (weekly), or light]
   - major surgical support equipment available (gas anesthesia machines, respirators, surgical lights, etc.)
   - facilities for aseptic surgery, surgical support, animal preparation, surgeon's scrub, operating room, and postoperative recovery
   - construction features of the operating room(s), including interior surfaces, ventilation, lighting, and fixed equipment used to support surgical procedures and other means of enhancing contamination control

Note: If preferred, the information requested in this section may be provided in Table.

All large animal surgery and some rodent surgeries are performed in the Graduate Science Research Center (GSRC) animal facility:

Operating rooms - [redacted]
Surgeon Prep - [redacted]
Animal Prep - [redacted]
Animal Recovery - [redacted]
Pack Prep/Support – [redacted]

Equipment in the GSRC facility includes:

Gas anesthetic machines
Animal respirators
Electrocautery unit
Pulse oximeters
Surgical lights, ceiling mounted
Surgical support port (Heraeus)
X-ray light boxes
Autoclave
Hydrogen peroxide sterilizer
Cardiovascular monitoring/recording equipment
Blood pressure monitors
ECG monitors
End tidal CO2 montitors
Defibrillators
Mobile recovery cages

Suction equipment
Surgical tables (patient and equipment)
Ultrasonic instrument cleaner

Usage of this facility is moderate to heavy. Multiple swine surgeries are performed weekly.

Rodent surgery may be conducted in investigator laboratories provided a specific space is designated and prepared in accordance with Guide recommendations.

3. **Surgical Procedures** [*Guide*, pp. 117-118]

   a. Describe the criteria used to differentiate major from minor survival surgery, including classification for certain procedures (e.g., laparoscopic technique).

The IACUC has defined major surgery as a procedure that penetrates and exposes a body cavity or produces substantial impairment of physical or psychological functions, e.g., laparotomy, thoracotomy, craniotomy, joint replacement, or limb amputation.

   b. How is non-survival surgery defined?

Survival procedures are those procedures from which the animal recovers from anesthesia. Any recovery from anesthesia is considered as survival. For a procedure to be considered non-survival, the animal must not be allowed to recover from anesthesia.

4. **Aseptic Technique** [*Guide*, pp. 118-119]

   a. Describe procedures, equipment, and protective clothing used for aseptic surgery. Include patient and surgeon preparation.

The DLAR animal surgery suite includes separate animal preparation room, surgeon preparation room, pack preparation/support room, operating rooms (2), and animal recovery. Prior to surgical procedures the operating room is cleaned and disinfected. The animal is given initial anesthesia in the animal prep room where the surgical site is shaved and an initial skin scrub performed. Following initial animal prep, the animal is moved to the OR and final skin prep is done. Surgeons scrub in the surgeons' scrub room located between the ORs. The DLAR staff or trained research staff assists in gowning and gloving the surgeon(s).

Investigators performing rodent survival surgery in their laboratories must have an area designated, must wear sterile gloves and mask, and use sterile instruments with aseptic technique.

b. Describe methods used to sterilize instruments and protective clothing, including a description of approved liquid sterilants and instrument exposure time(s) required for each, if applicable.

The surgery suite has a pack preparation/surgical support room which contains an autoclave for pack sterilization and a vaporized hydrogen peroxide sterilizer for certain implants and devices. For most surgery, prepackaged, disposable sterile gowns and towels are used; however, we have the capability of sterilizing protective gowns, drapes, and other ancillary equipment. Investigators performing rodent surgery prepare their own packs. Autoclaves are available in several laboratories and in the DLAR facilities in GSRC, Discovery and the School of Medicine for pack sterilization. For immediate use during rodent surgery, DLAR and investigators can use glass bead instrument sterilizers.

c. Describe methods for instrument re-sterilization between serial surgeries.

For rodent surgeries, autoclaved instruments may be sterilized using a bead sterilizer between procedures. Instruments must be re-autoclaved after a maximum of five procedures.

d. Indicate how effectiveness of sterilization is monitored.

Autoclave tapes are used to assure that adequate temperatures are reached in packs. The GSRC autoclave records all cycle times and temperatures for monitoring. A sterilizer check kit is periodically run through the autoclave to test its efficiency, and DLAR contracts for regular preventive maintenance on the autoclave.

e. Describe surgical support functions provided by the program to investigators.

Animal Resource Facilities provides facilities, equipment and space to investigators performing surgery. Technical assistance and training in specific procedures is available.

5. Intraoperative Monitoring [*Guide*, p. 119]

Describe monitoring and recording requirements for each species, including the type of record(s) maintained. Also note monitoring of anesthesia during non-survival procedures.

An intraoperative anesthetic monitoring chart is provided and required for swine surgeries. Heart rate, ECG, respiratory rate, oxygen saturation, and other parameters are monitored as appropriate.

There are no specific monitoring and recording requirements for rodents, rather the Principal Investigator describes their monitoring and record keeping in the AUP. This is reviewed by the IACUC, including the AV, on an individual basis. There is no difference in how anesthesia is monitored in survival vs. non-survival procedures. The same requirements apply to both survival and nonsurvival surgeries.

6. **Postoperative Care** [*Guide*, pp. 119-120]
   Describe the postoperative care program, including who is responsible for overseeing and providing the care, types of records maintained (e.g., perioperative), where the records are maintained, etc.

The vast majority of survival surgery done at this institution is performed on rodents in a designated area in the PI's laboratory. The PI and the PI's staff are responsible for overseeing procedures and providing postoperative care. The PI is responsible for maintaining all intraoperative and postoperative records for procedures. Those records are stored in the PI's laboratory and are made available to the Attending Veterinarian, DLAR personnel, and/or the IACUC upon request. They are inspected during the IACUC semiannual review.

Swine surgeries are performed at the dedicated surgery suite at the GSRC. They are performed by the PI or the PI's staff under the supervision the Attending Veterinarian or other veterinary staff. Records are maintained on all procedures performed in the animal's individual medical record.

E. Pain and Distress [*Guide*, pp. 120-121]

1. Describe how and by whom pain and distress are assessed.

A prospective assessment is done during the proposal review by the IACUC. Procedures for monitoring the animal and criteria to be used are included the AUP form.
During and after the procedure, the assessment is made by the surgeon and/or the surgical technician. For non-rodent surgeries, the veterinarian and DLAR veterinary staff provide oversight and assessment of the animals. For all species, DLAR personnel monitor post-surgical animals for signs of pain or distress such as lack of appetite, guarding, grinding teeth, etc during their daily observations. Criteria for monitoring post-operative pain are required in the AUP submission. All animals exhibiting signs associated with pain are evaluated. Unless a scientific justification for withholding post-operative analgesia is approved by the IACUC, all animals receive analgesics after surgery.

2. Describe training programs for personnel responsible for monitoring animal well-being, including species-specific behavioral manifestations as indicators of pain and

distress.

All personnel participating in the care of post-surgical rodents are required to complete modules on surgical anesthesia and analgesia. These modules cover behavioral manifestations of pain and distress. Personnel participating in swine surgery are trained to recognize signs of pain or distress in that species. Most personnel are veterinary technicians or have similar experiences with this species. All swine surgery, recovery, and postoperative monitoring is directly overseen by the AV.

F. Anesthesia and Analgesia [*Guide*, pp. 121-123]

1. List the agents used for each species.
Note: If preferred, this information may be provided in Table or additional Appendix.

The choice of anesthetic depends on the species and type of surgery/procedure.

The most commonly used agents for anesthesia and analgesia include:

Rodents:
Ketamine & Xylazine combinations
Acepromazine, Ketamine, & Xylazine combinations
Pentobarbital
Isoflurane
Sevoflurane
Lidocaine (topical anesthesia)
Buprenorphine
Nalbuphine
Butorphanol
Maloxicam
Carprofen

Pigs:
Acepromazine
Telazol/Xylazine
Pentobarbital
Pentothal
Isoflurane
Fentanyl
Buprenorphine
Flunixin Meglumine

2. Describe how the veterinarian provides guidance and advice to researchers concerning choice and use of anesthetics, analgesics or other pain moderating

methods.

Because the number of investigators doing surgery is small, the veterinarian usually has direct consultation with investigators about methods for anesthesia and analgesia. DLAR maintains a library with current texts on laboratory animal anesthesia and analgesia. Information on anesthesia and analgesia is placed in the newsletter periodically. The AV is a member of the IACUC, and therefore reviews all animal use proposals.

3. Describe the monitoring of the effectiveness of analgesics, including who does the monitoring. Include in the description any non-pharmacologic means used to diminish pain and distress.

The surgery section of the AUP includes a section for describing the use of anesthetics and analgesics intra- and post-operatively. The investigator is responsible for describing the procedures and the personnel who will be responsible for the animals. The principal investigator is responsible for anesthetic and analgesic use on his/her protocols.

During nonrodent surgeries in the DLAR surgery suite, DLAR personnel or research staff may administer and/or monitor the effectiveness of anesthetics and analgesics. The veterinarian is directly involved in the swine surgery program and is present for most surgeries.

The IACUC monitors effectiveness through the semiannual inspection of animal procedure areas, through protocol review, and through review of reports by PAM personnel, the attending veterinarian, and DLAR staff.

4. Describe how the veterinarian(s) and the IACUC/OB evaluate the proposed use of neuromuscular blocking agent to ensure the well-being of the animal.

The surgical section of the AUP has a section that must be completed when neuromuscular blocking agents are used. The Principal Investigator must specify how the patient will be monitored and how ventilation of the patient will be maintained. This is evaluated by the IACUC and the AV on a case-by-case basis. Currently, there is only one project where paralytics are used in surgery. In that project, heart rate, arterial pressure and other cardiovascular parameters are monitored to ensure adequate anesthetic depth in the paralyzed patient. The AV is present for most of these surgeries.

5. Describe policies and practices for maintaining and ensuring function of equipment used for anesthesia.

The IACUC has adopted a written policy on the maintenance of anesthetic vaporizers and scavenging equipment.

Anesthetic systems must be inspected and calibrated once every three years. The charcoal canisters must be weighed according to manufacturer recommendations and the weights recorded on the canister.

G. Euthanasia [*Guide*, pp. 123-124]

1. Describe approved methods of euthanasia, including humane slaughter (for additional guidance, see pertinent AAALAC Reference Resources). Include:
   - consideration of species, age, condition (e.g., gestational period, or neonatal) and
   - location(s) for the conduct of the procedure.

   Note: If preferred, this information may be provided in Table or additional Appendix.

Rodents:
Carbon dioxide gas in a chamber is the most common method.
Exsanguination following anesthesia (may be followed by cervical dislocation)
Cervical dislocation under anesthesia
Cervical dislocation without anesthesia (This method must be justified and approved by the IACUC).
Decapitation under anesthesia
Decapitation without anesthesia (This method must be justified and approved by the IACUC).
Gas anesthetic overdose

Fish:
Tricaine overdose
Hypothermia
Asphyxiation (field studies)

Swine:
Anesthetic overdose
Removal of heart under anesthesia
Administration of potassium chloride under anesthesia

2. Describe policies and practices for maintaining and ensuring function of equipment used for euthanasia.

Anesthetic vaporizer maintenance is as described above. CO2 chambers for rodents are cleaned after each use.

3. Describe the methods used to confirm death of an animal.

Death is confirmed by physically checking for a pulse and through visual examination for signs of cyanosis.

In addition, death in rats is confirmed by making an incision on each side of the chest penetrating the chest wall to visualize the lungs when euthanized by DLAR staff.

IV. Physical Plant [*Guide*, pp. 133-155]

A. Facilities Overview

Provide a brief introduction to the animal housing and use facilities. Note that this overview should augment the information provided in **Appendix 2** (Summary of Animal Housing and Support Sites), which includes area, average daily census, and person responsible for each site. Please use consistent terminology for the buildings/areas/sites described in the Location section of the Appendix. Please do not repeat information, but supplement the descriptions provided elsewhere to assist the reviewers understanding of the interaction between facilities, special housing locations, and separate procedural areas.

The Department of Laboratory Animal Resources (DLAR) operates three decentralized facilities in Columbia, SC:

1. The Graduate Science Research Center (GSRC)
2. The Discovery Biomedical Research Building
3. The School of Medicine animal facility (SoM)

The GSRC and Discovery facilities are located on the downtown USC campus. The SoM is approximately five miles away on the campus of the Dorn VA Medical Center. The SoM facility is separate and distinct from the Dorn VA Medical Center animal facility. An MOU exists between USC and the Dorn VA Medical Center that governs the sharing of facilities.

DLAR offices are housed within the GSRC, which is the main hub of operations for all DLAR activities. All shipments of animals and supplies are delivered to the GSRC, then dispensed to the other smaller facilities as needed.

There are three satellite facilities that house aquaria within one city block of the GSRC.

B. Centralized (Centrally-Managed) Animal Facility(ies)

In this section, describe each centralized or centrally-managed animal housing and use facility. Include in **Appendix 3** the floor plans of each on 8.5" x 11" or A4 paper. Ensure that the drawings are legible and the use of each room is indicated (animal housing, procedure room, clean cage storage, hazardous waste storage, etc.). Note that a separate section for describing "satellite housing areas" is included below.

Separately describe **each** Location or Animal Facility, addressing each of the features outlined below (1-8). A complete description of each must be provided; however, common features among locations or facilities may be indicated as such and do not need to be repeated.

1. General arrangement of the animal facilities (conventional, clean/dirty corridor, etc.).
2. Physical relationship of the animal facilities to the research laboratories where animals may be used.
3. Types of available animal housing spaces used, such as conventional, barrier, isolation/quarantine, hazard containment (infectious, radioactive, chemical), "animal cubicles" or facilities specifically designed for housing certain species such as ponds, pastures, feedlots, etc.
4. Finishes used throughout the animal facility for floors, walls, ceilings, doors, alleyways, gates, etc. (note any areas that are not easily sanitized and describe how these are maintained).
5. Engineering features (design, layout, special HVAC systems, noting exhaust air treatment, if applicable) used in hazardous agent containment.
6. Security features, such as control of entry, perimeter fences, gates, entryways, cameras, guards; identify and describe exceptions for individual facilities or areas incorporating fewer or additional security features than the general features described.
7. Consideration for facilities with exterior windows, if applicable, including management of environmental conditions (i.e., temperature and photoperiod control) and potential security risks.
8. Storage areas for flammable or hazardous agents and materials (e.g., disinfectants, cage-washing chemicals, pesticides, fuel).

Graduate Sciences Research Center (GSRC, also called the Palms Center for Graduate Science Research):

1. The GSRC serves as the primary animal facility for the campus. It is a single corridor conventional facility. Research laboratories are located in several adjacent buildings, but most animal procedures are performed in the animal facility. Animals taken from the facility are euthanized at the end of the procedure, except for a few experiments where the animals return to the facility. The animal facility occupies the entire basement floor and part of the first floor. This building houses the main DLAR offices. The Attending Veterinarian and Facility Manager have offices on the first floor. The supervisor has an office in the facility and oversees all animal care staff for the GSRC.
2. Location – The GSRC is located in downtown Columbia, SC. The Discovery Building is approximately four blocks away from the GSRC. The SoM facility is 5 miles from the GSRC.
3. Housing - The GSRC provides conventional housing for rodents in IVC cages and swine on raised floor pens. Housing for mice exposed to

hazardous agents is provided in room [redacted] There are three suites of cubicles, one used for quarantine for all other USC facilities.

4. Finishes:
   Floors - troweled epoxy over concrete except the surgery suite, which has seamless sheet vinyl flooring.
   Walls - masonry walls coated with epoxy. The corridor walls have a protective aluminum railing approximately 12" from the floor. Corners have s/s guards for protection.
   The operating rooms have ceramic tile walls
   Ceilings - room ceilings are solid double-layer gypsum board with epoxy coating. Corridors have suspended ceilings with waterproof vinyl coated tiles.
   Doors - Metal, sealed at top and bottom, with a bottom sweep.
   The cage wash area, surgery area, and 1 animal suite have sliding glass doors with electric openers. The large animal area is isolated by metal double doors with electric openers in the corridor.
5. All biohazards in use are ABSL-2 or below. Hazardous agent use is typically restricted to room [redacted]. Animals are housed on negative pressure IVC racks and cages are changed under a biosafety cabinet. The room air pressure is negative to the corridor.
6. Security - Entry into the animal facility is controlled by DLAR through a RFID card control system (Rees Scientific). The University issues RFID cards to all faculty, staff, and students. Individuals who require access to the animal facility initially present their card to DLAR. The Facility Manager verifies that the individual is on an active animal use protocol, has been cleared by the OHSP to work with animals, and is on an active AUP. If those conditions are met, the Facility Manager will program that individual's card into DLAR's Rees Scientific card control system. The times that entry is allowed can be controlled for individual cards. The system allows variable times for entry depending on the user's needs. The RFID card is also required for opening dock doors and for the elevator. Individual animal room doors in may be locked for added security. The manager is the key control officer for DLAR. The USC Police Department provides periodic patrols outside the facility on a 24-hour basis and monitors the animal facility via 12 cameras.
7. Windows - There are no windows in this facility except for offices.
8. Storage - The feed storage room is equipped with tubular aluminum racks approximately 18" off the floor. The room is maintained at 70°F. The feed room is also equipped with a 6' x 10' walk-in cooler that maintained at 45-50°F for storage of special diets. Bedding is stored on racks approximately 18" off the floor in a storage area connected to the clean side of cage wash and is maintained around 70°F. Storage for caging and equipment in regular use is provided in [redacted], the large room adjacent to the clean cage preparation area, and in room [redacted], which connects to the [redacted] Offsite commercial storage is used for long term storage of caging and equipment

not in use. Cleaning chemicals and other chemical supplies (floor cleaners, etc.) are stored in a designated chemical storage room near the cage wash area ([redacted]). Dry stores (mops, towels, sponges, etc) are stored in designated storerooms ([redacted]). Acids, bases, and other lab reagents are stored in designated storage areas in the laboratory ([redacted]). Formalin is stored in the necropsy room chemical hood. There are no other hazardous or flammable materials stored in the facility.

The School of Medicine (SoM):

1. The School of Medicine animal housing facility is in [redacted] at the School of Medicine campus. The main facility is on the ground floor. Animals are routinely taken to laboratories in this and adjacent buildings, including the Dorn VA Medical Center, and later returned to the facility. The SoM is a single corridor conventional facility. Three animal rooms and several behavior laboratories are located on the second floor of the same building. A supervisor maintains an office within the facility and oversees all animal care technicians. This supervisor also oversees the operation of the Discovery animal facility.
2. The SoM facility is 5 miles from the GSRC on the campus of the Dorn VA Medical Center. However, it is distinct and separate from the Dorn VA Medical Center animal facility.
3. Housing - The SoM provides conventional housing for rodents in IVC and static microisolator cages. Housing for mice exposed to hazardous agents is provided in room [redacted]. The room air pressure is negative to the corridor.
4. Finishes:Floors - troweled epoxy over concrete.
   Walls - masonry walls coated with epoxy. The corridor walls have a protective aluminum railing approximately 12" from the floor. Corners have s/s guards for protection.
   Ceilings - Suspended ceilings with waterproof vinyl coated tiles.
   Doors – Metal or sealed wood, with a bottom sweep.
5. All biohazards in use are ABSL-2 or below. Hazardous agent use is typically restricted to room [redacted]. Animals are housed on negative pressure IVC racks and cages are changed under a biosafety cabinet.
6. Security: Entry into the animal facility is controlled by DLAR through the same RFID card control system (Rees Scientific) as the GSRC.
7. Windows - There are no windows in this facility except for offices.
8. Storage areas:
   Feed is stored in a walk-in cooler in room [redacted].
   Bedded rodent cages, bedding and other non-chemical supplies (face masks, gloves) are stored in a separate room off the main corridor outside the animal housing area. The amount of material stored at the School of Medicine is kept to approximately a 2-week supply.
   Short term storage for cages in frequent use is located on the clean side of the cage wash facility or in a designated storeroom in the facility. Long term

storage is provided in several rooms at an offsite commercial storage facility.

Storage for hazardous or flammable chemicals is provided outside the animal facility by the Safety Office. Hazardous materials are not stored in the facility.

Discovery Biomedical Research Building (Discovery)

1. The Discovery animal facility is located on the ground floor with two additional animal rooms on the third floor. The area is serviced by DLAR technicians and their work is overseen by the SoM Supervisor. Animals are sometimes taken to an adjacent building for experimental procedures. Those animals will either be euthanized in the laboratory or, in some cases, returned to the Discovery facility.
2. The Discovery building is located downtown, approximately 4 blocks from the GSRC.
3. Housing - The Discovery animal facility provides conventional housing for rodents in IVC and static microisolator cages. Housing for mice exposed to hazardous agents is provided in room [redacted].
4. Finishes:
   Floors - troweled epoxy over concrete.
   Walls - masonry walls or sheetrock coated with epoxy. The corridor walls have a protective aluminum railing approximately 12" from the floor. Corners have s/s guards for protection.
   Ceilings – animal room ceilings are solid double-layer gypsum board with epoxy coating. Corridors have suspended ceilings with waterproof vinyl coated tiles.
   Doors - Metal, sealed at top and bottom, with a bottom sweep.
   The cage wash area, surgery area, and 1 animal suite have metal doors with electric openers.
5. All biohazards in use are ABSL-2 or below. Hazardous agent use is typically restricted to room [redacted]. Animals are housed on negative pressure IVC racks and cages are changed under a biosafety cabinet. The room air pressure is negative to the corridor.
6. Security: Entry into the Discovery animal facility is controlled by DLAR through the same RFID card control system (Rees Scientific) as the GSRC.
7. Windows – The only windows are present in the cage wash facility. The public does not have convenient access to these windows due to their location and they are not considered a security concern.
8. The feed storage room is equipped with tubular aluminum racks approximately 18" off the floor. The room is maintained at 70°F. The feed room is also equipped with a 3' x 6' cooler that maintained at 45-50°F for storage of special diets.
   Bedding is stored on racks approximately 18" off the floor in a storage area connected to the clean side of cage wash and is maintained around 70°F. There is no storage of hazardous agents in this animal facility.

C. Satellite Animal Housing Facilities

In addition to the Appendices summarizing Heating, Ventilation, and Air-Conditioning (**Appendix 11**) and Lighting Systems (**Appendix 16**), summarize animal housing areas that are not centrally-managed or maintained in (**Appendix 17**), "Satellite Animal Housing Areas."

1. Describe the criteria used to determine/define a "Satellite Animal Housing Area," which may include remote housing facilities or laboratories temporarily or consistently housing animals.

Satellite animal housing areas are those where animals are housed for periods longer than 12 hours and are not managed by DLAR. Currently there are 3 satellite animal facilities; two are investigator-maintained zebrafish facilities at the downtown Columbia campus and the other is the Belle W. Baruch Institute for Marine Biology and Coastal Research. This institute maintains an aquatic facility on the downtown Columbia, SC campus and a coastal field station in Georgetown, SC. Animals are permanently housed in the Columbia satellite facilities.

2. Describe the process used by the IACUC/OB to authorize, provide oversight of, and ensure compliance with *Guide* standards for the housing of animals outside of centrally-maintained facilities. Include a description of Attending Veterinarian access and physical security.

The process for IACUC approval to house animals outside the facility is the same for animals housed within the facility with additional requirements. In addition to IACUC approval, the housing site must be inspected and approved by the Attending Veterinarian before animals can be housed there. The housing locations are inspected every six months as part of the semiannual facility inspection process. The Attending Veterinarian has unfettered access to all animals at all times. All facilities are secured with physical locks, either key, combination, or both.

D. Emergency Power and Life Support Systems

Note: Complete a Heating, Ventilation, and Air-Conditioning (HVAC) Summary (**Appendix 11**) and Lighting Summary (**Appendix 16**) for each Location described in the Summary of Animal Housing and Support Sites (**Appendix 2**).

1. **Power** [*Guide*, p. 141]
   For each Location, Centralized Animal Facility, and Satellite Housing Facility, provide a brief description of the following:
   - Availability of emergency power and if so, what electrical services and equipment are maintained in the event the primary power source fails.

- History of power failures, noting frequency, duration, and, if emergency power was not available, steps taken to ensure the comfort and well-being of the animals present and the temperature extremes reached in animal rooms during the failure.

The University is served by redundant power stations, so outages are rare.

The GSRC and Discovery buildings both have dedicated emergency generators. In event of power failure, the generator supplies the animal area air handlers, coolers, animal room lighting and wall outlets, and surgery lights and outlets. The generators are tested weekly.

The SOM has an emergency power generator. In event of power failure, the generator supplies the animal area air handlers, coolers, animal room lighting and wall outlets. The generator is tested monthly.

There have been no power failures to report.

2. **Other System Malfunctions.** If not previously reported, describe animal losses or health problems resulting from power, HVAC, or other life support system (e.g., individually ventilated cages) failures, and mechanisms for reporting such incidences. AAALAC International Rules of Accreditation (Section 2.f).

The HVAC systems in the University's animal facilities do not directly control humidity. Rather, humidity is controlled to the maximum extent possible.by adjusting air flow and air exchange rates. When outdoor temperatures drop rapidly, there is often a coinciding decrease in humidity within the animal facility. When this occurs, we have seen sporadic cases of ringtail in rodents. Room humidifiers are used until the relative humidity equilibrates to acceptable levels.

E. Other Facilities [*Guide*, pp. 144, 150]

1. Other Animal Use Facilities [*Guide*, pp. 146-150]

Describe other facilities such as imaging, irradiation, and core/shared behavioral laboratories or rooms. Include a description of decontamination and methods for preventing cross-contamination in multi-species facilities.

The Colon Cancer Center maintains and IVIS bioluminescence imager in the GSRC animal facility. Only mice are imaged in this machine and it is cleaned with HALO sterilant between groups.
There is a large animal ultrasound unit that is used in the surgery prep area. It is wiped clean with HALO between patients.

The Exercise Science department maintains a DEXA scanner in the Discovery building. It is disinfected by HALO between uses.
The SoM has a DEXA scanner in the animal facility. It is cleaned with HALO between uses.
The Department of Physiology, Pharmacology, and Neuroscience at the SoM maintains a rodent surgery room for its faculty. Surgical areas are disinfected with HALO between uses.

2. **Other Animal Program Support Facilities**
Describe other facilities providing animal care and use support, such as feedmills, diagnostic laboratories, abattoirs, etc.

N/A

Appendix 1: Glossary of Abbreviations and Acronyms

Please provide a Table defining abbreviations and acronyms used in this Program Description.

Abbreviation/Acronym	Definition
GSRC	Graduate Science Research Center
SoM	School of Medicine
Discovery	Discovery Biomedical Research Building
USC	University of South Carolina

Appendix 2: Summary of Animal Housing and Support Sites

Briefly summarize in the following Table the animal facility or facilities, noting the number of areas in which animals are housed (buildings, floors, farms, etc.), the total square footage/metres (or acreage) for animal care and use, and the total square footage/metres (or acreage) for necessary support of the animal care and use program covered by this Description (water treatment plant/area if housing aquatic or amphibian species, cagewashing facilities, service corridors, etc. and additional areas to be considered are enumerated in the *Guide*). If more than one facility/site, note the approximate distance (yards/miles or meters/kilometers) to each facility from a reference point such as from the largest animal facility. A campus/site map (with a distance scale) may be included as an additional Appendix (Appendix 2.1) to provide this information. See Instructions, Addendum A - Animal Facility Square Footage/Meters Compilation Form for guidance in calculating the size of your animal care and use program.

Animal Housing and Support Sites						
Location (building, site, farm name, etc.[a])	**Distance from main facility[b]**	**Approx. ft^2, m^2, or acreage for animal housing**	**Approx. ft^2, m^2, or acreage for support or procedures**	**Species housed**	**Approx. Daily Animal Census by species**	**Person in charge of site**
Graduate Science Research Center (GSRC)	GSRC is the main DLAR facility and serves as the hub for other facilities	7,200	8,900 + 1,600 office = 10,500	Mice Rats Peromyscus Swine	3000 20 3000 10	Director, DLAR
Discovery Biomedical Research Building	0.2 miles	2,800	7,348	Rats Mice	130 0	Director, DLAR
USC School of Medicine	5 miles (located on the grounds of the Dorn VA hospital)	5,300	2,000	Rats Mice	150 2000	Director, DLAR
Baruch Institute for Marine Biology-USC Campus	200 feet	1,800	Holding tanks and equipment serviced in place	Marine invertebrates, Fish	8	[redacted], Director

Appendix 2: Summary of Animal Housing and Support Sites

Animal Housing and Support Sites						
Location (building, site, farm name, etc.[a])	**Distance from main facility[b]**	**Approx. ft^2, m^2, or acreage for animal housing**	**Approx. ft^2, m^2, or acreage for support or procedures**	**Species housed**	**Approx. Daily Animal Census by species**	**Person in charge of site**
Baruch Institute for Marine Biology – Marine Field Lab, Georgetown, SC	125 miles	3,100	Holding tanks and equipment serviced in place	Marine invertebrates, Fish	0	[redacted], Director

Totals:	20,200	19,848
Total animal housing and support space:	40,048 ft^2 **(please specify ft^2 or m^2)**	

[a] Please state name and/or use acronyms described in **Appendix 1** for building names, if not coded for confidentiality.

[b] Campus or site map(s) may also be provided in lieu of this information.

Appendix 3: Line Drawings

[redacted]

Graduate Science Research Center

Appendix 3: Line Drawings

[redacted]

1 EXISTING BASMENT LEVEL, OVERALL
SCALE: 1/16" = 1'-0"

School of Medicine Basement (Animal Facility)

Appendix 3: Line Drawings

[redacted]

School of Medicine Second Floor (Animals are housed in [redacted] for behavioral studies)

Appendix 3: Line Drawings

[redacted]

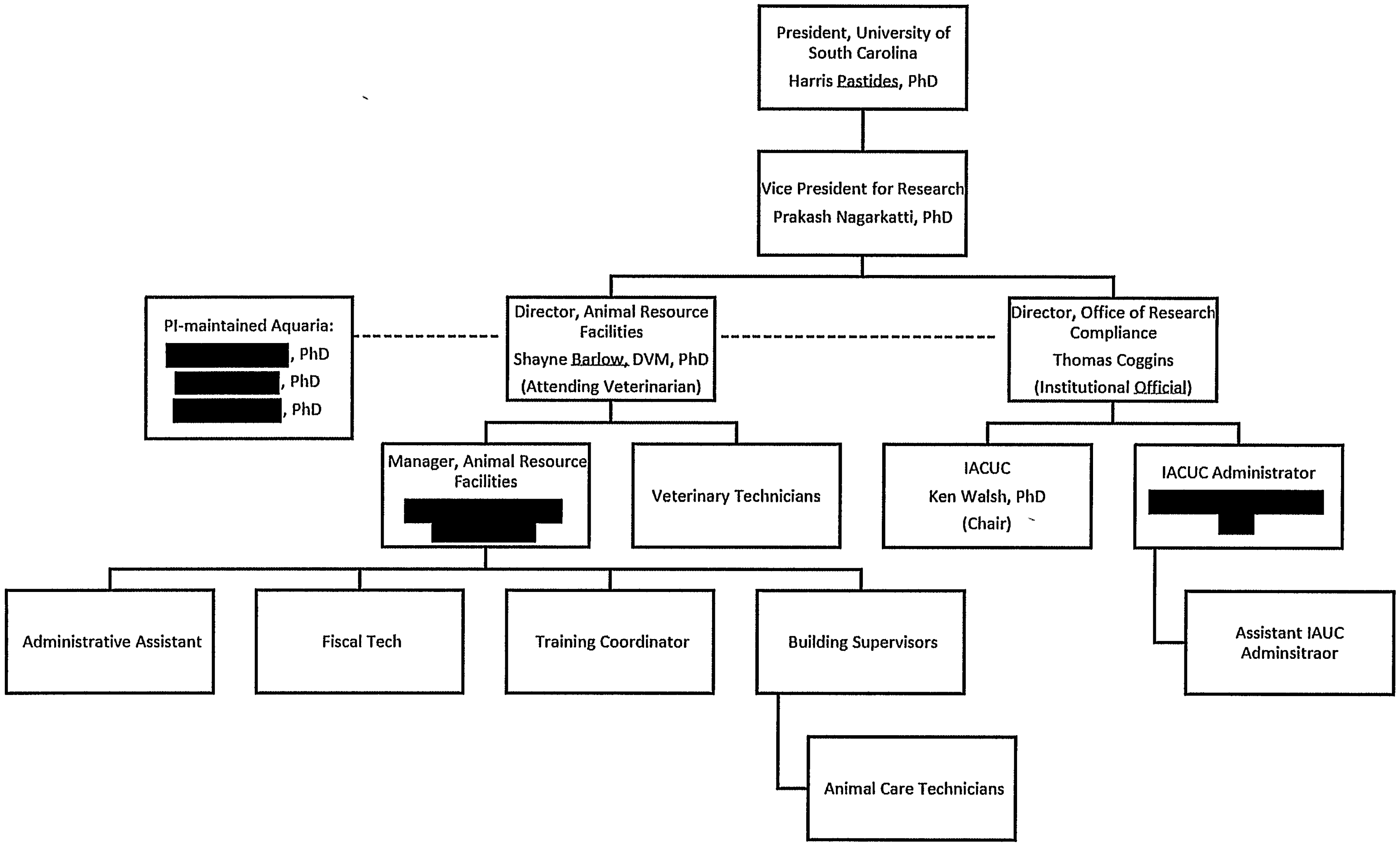
Discovery First Floor (Animal Facility)

Appendix 3: Line Drawings

[redacted]

Discovery Third Floor (Animal Rooms are [redacted])

Appendix 4: Organizational Chart(s)



Appendix 5: Animal Usage

In order to assist the site visitors in their evaluation of the animal care and use program, please provide the information requested below. Information should be provided for all animals approved for use in research, teaching or testing, including those which may be used or housed in laboratories outside the animal care facility. Of particular interest is information on those animals which are used in research projects involving recovery surgical procedures, behavioral or other testing requiring chairing or other forms of restraint, or exposure to potentially hazardous materials. An alternate format is acceptable as long as the information requested is provided.

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Elucidating the Role of the Ubiquitin Ligase Wwp1 in Postnatal Cardiac Remodeling and in Hypertrophic Cardiomyopathy	2254-100987-042415	[redacted]	Mouse	2173	C, D					X	
Methamphetamine-induced locomotor sensitization in HIV-1 Transgenic Rats	2255-100972-042915	[redacted]	Rat	136	D						
Angiogenesis and Capillary Permeability in Atherosclerotic Lesions	2257-100962-060115	[redacted]	Mouse	722	D	X					
Teratoma Assay	2260-101018-062315	[redacted]	Mouse	27	C						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Role of myocyte-derived exosomes in regulation of myocardial fibrosis	2261-101013-062615	[redacted]	Rat	24	B						
Modeling individual differences in PTSD	2263-101002-071715	[redacted]	Rat	529	E	X			X		X
Examination of Fish Movement and Behavior in Estuarine Habitats Using Passive Integrated Transponder (PIT) Technology.	2264-101032-080315	[redacted]	Fish	11000	C						
Role of pattern recognition receptors in bromodichloromethane induced metabolic syndrome and nonalcoholic steatohepatitis	2265-101025-081115	[redacted]	Mouse	745	B, C, D					X	
Left-right mammary tumorigenesis	2267-101030-082615	[redacted]	Mouse	340	D						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Identifying a new circuit that controls feeding behavior: leptin and serotonin interactions.	2268-100995-082615	[redacted]	Rat	438	D	X	X	X			
Neurotransmitter roles in Depression and Neurodegenreative Diseases	2269-101023-083115	[redacted]	Mouse, Rat	3672	D, E	X			X	X	
Mechanisms linking obesity to breast cancer	2271-101040-091815	[redacted]	Mouse	976	C, D	X					
Examination of the impact of abiotic and biotic factors on the ecology and biology of salt marsh fishes.	2273-101047-093015	[redacted]	Fish	9100	C						
Mechanisms linking obesity to colon cancer	2274-101041-100715	[redacted]	Mouse	1840	C, D, E	X		X		X	
Polymer/Copper nanocomplex for cancer targeted therapy	2275-100994-101415	[redacted]	Mouse	708	D						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Rodent Breeding Colonies for Evaluation of Matrix Metalloproteases Contribution to Myocardial Remodeling	2277-101062-101615	[redacted]	Mouse	13794	C						
Characterizing PDE11A function in brain	2278-101043-101615	[redacted]	Mouse, Rat	9052	B, C, D, E	X		X	X	X	
Effects of Brown Adipose Tissue on Metabolism	2280-101048-111115	[redacted]	Mouse	400	B, C, D			X		X	
Mechanisms of Cardiac Remodeling Following Myocardial Infarction	2281-100965-121115	[redacted]	Swine	195	D	X	X				
Baruch Display Aquariums (All Displays)	2282-101074-121615	[redacted]	Fish	25	B						X
Role of innate and adaptive immunity in bromodichloromethane induced metabolic syndrome and nonalcoholic steatohepatitis	2283-101072-011316	[redacted]	Mouse	144	C					X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Characterization of signaling pathways and transcription factors in pituitary gland organogenesis	2286-101082-012916	[redacted]	Mouse	5544	C						
Orexin-A as a modulator of individual differences in PTSD-like behavior	2287-101033-020316	[redacted]	Rat	128	E						
Progression of Attentional and Executive Function Deficits in HAND: S-Equol Protection	2288-101084-020516	[redacted]	Rat	584	B, D			X			
Cachexia in ApcMIN/+ mice: Muscle Anabolic Resistance	2289-101081-021016	[redacted]	Mouse	24147	C, D	X		X		X	
Growth of estrogen receptor-positive human breast cancer cells in Peromyscus	2290-101093-021916	[redacted]	Peromyscus	81	C					X	
Effects of polyvinylpyrrolidone (PVP)-coated iron oxide nanoparticles on high-fat-diet induced obesity	2291-101095-022416	[redacted]	Mouse	400	C						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Mast cells in prostate carcinogenesis, prostate cancer progression and metastasis	2292-101090-030216	[redacted]	Mouse	1920	C						
Neurocognitive Assessments of Executive Function	2293-101096-030816	[redacted]	Rat	147	C						
Biouptake of silver nanoparticles through drinking water exposure	2294-101067-031716	[redacted]	Mouse	1440	C						
Studies on the role of endoplasmic reticulum stress in diabetes	2295-101100-032416	[redacted]	Mouse, Peromyscus	258	B, C			X		X	
Role of TGFbeta in cardiovascular development and disease	2296-101097-040616	[redacted]	Mouse	83849	B, C					X	
The role of COX-2 in valproic acid (VPA)-induced fetal malformation.	2297-101114-042216	[redacted]	Mouse	121	B, C						
The role of dopamine transporter in NeuroAIDS	2298-101079-042616	[redacted]	Mouse	928	B, D						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
The Molecular Mechanism of Cardiovascular Disease	2299-101045-042716	[redacted]	Mouse, Rat	13288	C, D	X		X		X	
Breeding Only Protocol	2300-101058-042716	[redacted]	Mouse	13679	C						
Graphene-based Biosensor Arrays for Ion Channel Drug Discovery	2301-101113-050416	[redacted]	Rat	660	C						
Development of a mouse model for sporadic colon cancer	2302-101109-051016	[redacted]	Mouse	162	B, C			X		X	
Reversal of Myocardial Infarction by Localized Stimulation	2304-101112-051116	[redacted]	Swine	80	C	X					
Effect of I3C on Helicobacter hepaticus-associated colitis and miRNA regulation	2305-101110-051816	[redacted]	Mouse	420	C, D, E					X	
Mapping and characterization of Peromyscus mutants cataract-webbed and dominant spot	2306-101120-051816	[redacted]	Peromyscus	5763	C						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Neurobiological Mechanisms of social stress-induced affective and cardiovascular disease	2307-101116-051816	[redacted]	Mouse, Rat	1178	C, D, E	X	X	X	X	X	
Dysregulation of Tissue Inhibitor-4 with Pressure Overload Heart Failure	2308-101123-052316	[redacted]	Mouse, Swine	958	D	X				X	
Plants as Bioreactors to produce Edible MicroRNAs targeting colon cancer.	2309-101131-052416	[redacted]	Mouse	90	C						
Therapeutic Biomaterials for Aortic Aneurysm Attenuation	2310-101036-070816	[redacted]	Mouse	202	D	X					
Study of neurotransmitter levels in developmental and neurological disorders	2311-101094-072516	[redacted]	Mouse	6542	D, E	X		X		X	
Maternal Obesity Induced Transgenerational Cancer Risk	2312-101138-072516	[redacted]	Mouse	200	C, E					X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Biomaterials for the prevention and treatment of colon cancer.	2313-101129-072916	[redacted]	Mouse	304	D	X					
Regulation of the allergic response by the flavonol Morin	2314-101143-082516	[redacted]	Mouse	216	C, E						
Protein Succination as a Mediator of Neuropathology in Mitochondrial Disease	2315-101140-083116	[redacted]	Mouse	856	B, C, D					X	
Role of Microbes in Development and Maintenance of Pseudomyxoma peritonei	2316-101128-083116	[redacted]	Mouse	250	D					X	
Investigate novel mechanisms in the development and treatment of leukemia.	2317-101133-090716	[redacted]	Mouse	4960	C, D					X	
Post-transcriptional regulation in axon growth	2318-101144-090716	[redacted]	Rat	2705	C, E	X	X				
Accelerating peripheral nerve regeneration through spatial signaling	2319-101141-090916	[redacted]	Mouse	4590	C, E	X					

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
CCL8 and carcinogenesis	2320-101155-091616	[redacted]	Mouse	521	B, C						
Development of a model to study the release and impact of inhibitors of inflammation (e.g. steroids and antibodies to interleukins) on wound healing and capsule formation around biomedical devices	2322-101146-102116	[redacted]	Rat	173	D	X					
Identification of new mechanisms of neurotoxicity induced by HIV on primary cultures of rodent neurons	2323-101158-111816	[redacted]	Mouse, Rat	124	C						
Neuronal mechanisms of cocaine seeking	2324-101167-120116	[redacted]	Mouse, Rat	1061	B, D	X		X		X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
The Role of Microbiome in Intestinal Tumor Development and Response to 5-FU Chemotherapy	2325-101159-121416	[redacted]	Mouse	500	C, D, E					X	
Effects of Exercise and Insulin on Mice	2326-101166-121516	[redacted]	Mouse	5695	B, C, D	X		X	X	X	
in vivo Approaches to Modulate Axonal mRNA Transport and Translation	2328-101171-121916	[redacted]	Mouse, Rat	15881	C, E	X	X			X	
Investigating TGFB superfamily as therapeutic targets in cancer	2329-101161-121916	[redacted]	Mouse	900	D	X				X	
Mast cell-based non-invasive screening for colorectal cancer	2330-101173-010617	[redacted]	Mouse	240	C						
Role of microRNA in Resveratrol-mediated suppression of mast cell-driven inflammation	2331-101172-020617	[redacted]	Mouse	636	C, E				X		
Nanoparticle for targeted therapy	2332-101169-020917	[redacted]	Mouse	612	C						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Correlating Climate Variability, Fish Courtship Sounds, and Juvenile Fish Abundance	2333-101181-022217	[redacted]	Fish	81900	C, E						
Analysis of Drug Dependence and Co-morbid Disorders	2334-101180-022717	[redacted]	Mouse	3560	B, C, E	X	X			X	
Effect of doxorubicin on the mouse female reproductive function	2335-101179-022817	[redacted]	Mouse	1500	C					X	
Maintenance of Mouse Colonies needed to Examine the Role of the Ubiquitin Ligase ITCH in Intestinal Epithelial Homeostasis	2337-101183-030317	[redacted]	Mouse	1014	C						
North Inlet- Winyah Bay National Estuarine Research Reserve: Nekton Monitoring and Research Program	2338-101197-030317	[redacted]	Fish	118440	E						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Effects of Chemotherapeutic Chemical Doxorubicin on Uterine Functions	2339-101187-030817	[redacted]	Mouse	80	C					X	
Breeding Colonies for studies on Cancer, Inflammation and Autoimmune Disease	2340-101195-031317	[redacted]	Mouse	9096	C						
Breeding Colonies for Studies on Immunomodulation	2341-101198-032217	[redacted]	Mouse	9185	C						
Regulation of hematopoietic stem cell differentiation by Ing4	2342-101188-032217	[redacted]	Mouse	740	C, D						
Breeding colonies for colon cancer studies	2343-101200-032217	[redacted]	Mouse	11643	C						
Emodin as a chemopreventive agent for breast cancer	2344-101185-032817	[redacted]	Mouse	1820	B, C, D	X	X				
Breeding colonies for Estrogen T cell interaction study	2345-101192-032817	[redacted]	Mouse	2900	B, C						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Breeding colonies for studying T cell-endothelial cell interactions.	2346-101204-041317	[redacted]	Mouse	79219	C						
Ovarian Function Regulation of IL-6 induced cachexia in the Apc min/+ mouse	2347-101199-041717	[redacted]	Mouse	560	D	X	X	X			
Adipose tissue specific fumarase deficiency: effects on whole body metabolism	2348-101184-041917	[redacted]	Mouse	362	B, C			X		X	
Peromyscus Laboratory Models for Biomedical Research	2349-101211-041917	[redacted]	Peromyscus	42584	B, C	X		X			
Effects of a high fat diet on macrophage induced inflammation and metabolic dysfunction	2350-101201-042017	[redacted]	Mouse	455	D	X		X		X	
Polo-box PLK1 Inhibitors Target Tumors Resistant to ATP Competitive Compounds	2351-101206-042017	[redacted]	Mouse	248	D						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Can tolylfluanid negatively impact skeletal muscle growth and metabolism in adult zebrafish?	2352-101175-050117	[redacted]	Fish	1100	B, C					X	
Chemokines and alternative medicinal compound mediated Inflammatory Bowel Disease and bladder Inflammation	2353-101209-051017	[redacted]	Mouse	156	D, E					X	
The effect of exercise and muscle contraction on chemotherapy-induced skeletal muscle dysfunction	2354-101194-051217	[redacted]	Mouse	1152	C	X		X		X	
Indole-mediated epigenetic regulation of T cells in colitis and Resvertrol-mediated epigenetic regulation of MDSC in EAE	2355-101205-051517	[redacted]	Mouse	3220	C, E			X		X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Phylogeographic Patterns Among Eastern Newts (Notophthalmus viridescens) in the Southeastern United States	2356-101213-051817	[redacted]	Newts (Field Study)	340	D						
Estrogen T cell interactions	2357-101217-051817	[redacted]	Mouse	11552	B, C, D					X	
The role of COX-2 in osteoarthritis	2358-101220-051817	[redacted]	Mouse	2268	B, C					X	
Genomic analysis of autism traits in Peromyscus (deer mice)	2359-101212-052417	[redacted]	Peromyscus	725	C						
Primary neuronal cell culture studies of HIV-1 Cure strategies	2360-101224-052517	[redacted]	Rat	792	D						
Detection and evaluation of Zika Virus in female reproductive system	2361-101216-052517	[redacted]	Mouse	148	C					X	
Role of COX-2 in development and progression of colorectal cancer	2362-101221-053117	[redacted]	Mouse	2010	B, C			X		X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Studies on Inflammatory and Autoimmune Diseases	2363-101196-053117	[redacted]	Mouse	136306	B, C, D, E	X				X	
Epigenetic regulation of hematopoietic stem cell specification in Zebrafish	2364-101193-060217	[redacted]	Fish	47400	B, C	X				X	X
Maintenance of Mouse Colonies Needed for the Examination of the Role of Wwp1 in Cardiac Disease	2365-101250-062917	[redacted]	Mouse	2058	C						
HIV-1 protein transgenic mice breeding protocol - gp120 and Tat	2366-101252-071217	[redacted]	Mouse	520	C						
Genetic determinant of tumor progression and chemotherapeutic response in mouse models of colorectal cancer	2367-101253-071817	[redacted]	Mouse	4234	C, D	X	X			X	
The role of Lis1 in dynein-dependent axon transport	2368-101255-072417	[redacted]	Mouse, Rat	3594	B, C, D, E	X				X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Maintenance of Transgenic and Knock-out Mice for Studies in Colorectal Cancer by the Mouse Experimentation Core Facility of the Center for Colon Cancer Research.	2369-101242-072617	[redacted]	Mouse	32332	C						
Nanoparticles and Immunoregulation	2370-101265-072617	[redacted]	Mouse	447	C, D					X	
T cell-endothelial cell interactions	2371-101254-072617	[redacted]	Mouse	113860	C, D, E					X	
Endocrine Disruptors and Immunoregulation	2372-101257-073117	[redacted]	Mouse	8962	B, C, D, E					X	
The Role of Bone Marrow Derived Cells in Liver Metastasis of Colorectal Cancer	2373-101246-080217	[redacted]	Mouse	1228	C, D	X	X				
Immunomodulatory effects of cannabinoids	2374-101258-080217	[redacted]	Mouse	15246	B, C, D, E	X		X		X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
p53 as a target for dietary intervention in colitis and colon cancer	2375-101235-081417	[redacted]	Mouse	12980	D, E					X	
Extracellular matrix remodeling in the pregnant heart	2376-101215-081617	[redacted]	Mouse	1847	B, C						
Immunomodulatory effects of plant products.	2377-101266-082317	[redacted]	Mouse	41465	B, C, D, E					X	
Evaluation of subcutaneous delivery of a Neuregulin-like peptibody with left ventricular failure in pigs post-myocardial infarction: PK/PD studies	2378-101275-083017	[redacted]	Swine	12	D	X					
Neurobiological Mechanisms of Apathy in HAND	2379-101225-083117	[redacted]	Rat	960	D	X	X				
Sentinel Monitoring Program	2380-101270-091217	[redacted]	Mouse, Rat, Peromyscus	4902	C						

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Holding Protocol for Laboratory Animals	2381-101271-091317	[redacted]	Mouse, Rat, Peromyscus	2125	B, C, D						
Breeding protocol in pursuit of HIV cure	2382-101223-092117	[redacted]	Rat	1920	B						
Biomechanics of Atherosclerotic and Aneurysmal Mouse Arteries - Role of Extracellular Matrix	2383-101273-092117	[redacted]	Mouse	1149	D						
Immunotoxicity of compounds.	2384-101261-092817	[redacted]	Mouse	3050	C, D					X	
Kubinak Lab Breeding Protocol	2385-101287-100417	[redacted]	Mouse	4080	B, C						
Role of HER2 in breast cancer (breeding only)	2386-101286-100417	[redacted]	Mouse	972	C						
Regulation of autophagy in chemotherapy-induced heart failure	2387-101272-100417	[redacted]	Rat	528	D					X	
Modulation of Synaptic Transmission and Plasticity	2388-101202-100417	[redacted]	Rat	1944	D, E	X				X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Neurological Studies of Transgenic HIV-1 Rats	2389-101244-101317	[redacted]	Rat	160	D	X		X			
Anti-Depressant treatment of HAND	2390-101282-101317	[redacted]	Rat	320	D	X		X			
Role of HER2/neu in regulation of breast cancer stem cells	2391-101279-102417	[redacted]	Mouse	2394	B, C, D	X					
Preventive and therapeutic treatment for cancer	2392-101290-102517	[redacted]	Mouse	252	C, D						
Cancer Therapeutics Studies in Animal Models	2393-101263-102717	[redacted]	Mouse	2608	C, D	X				X	
Using Satellite Telemetry to Track Environmental and Geographic Preference of a Juvenile Scalloped Hammerhead Shark (Sphyrna lewini)	2394-101267-103017	[redacted]	Fish	3	C						
Using DREADD technology to activate specific neural pathways in HIV-1 Transgenic animals	2395-101283-103017	[redacted]	Rat	160	D	X				X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
NPY, Anxiety and Ethanol	2396-101278-103017	[redacted]	Rat	738	D, E	X			X	X	X
Effect of NAD precursors on primary neurons	2397-101285-110617	[redacted]	Rat	280	C						
Nervous system development in zebrafish	2398-101289-111717	[redacted]	Fish	66900	B, C					X	X
The benefits of Ojeok-san on cancer induced visceral pain	2399-101260-111717	[redacted]	Mouse	780	E			X		X	
Mouse Breeding Colony for Studies in Vascular Remodeling and Atherosclerosis	2400-101293-112017	[redacted]	Mouse	1839	B, C						
Studies on the Role of Antibody Deficiencies in Promoting Host-Microbiome Dysbiosis	2401-101292-112817	[redacted]	Mouse	2140	C, E			X		X	
Biomaterials for Tissue Engineering and Immunomodulation	2402-101304-112917	[redacted]	Mouse	867	D	X		X		X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Mast cells and Sphingosine-1-phosphate in allergic inflammation	2403-101303-010818	[redacted]	Mouse	1902	C, D					X	
Humane Handling of Mice and Rats	2404-101311-012318	[redacted]	Mouse, Rat	600	D						
Mechanisms of Helicobacter pylori-mediated gastric cancer prevention by dietary indoles	2405-101313-012618	[redacted]	Gerbil	512	C, D					X	
Cancer stem cells-Targeted treatment	2406-101308-020618	[redacted]	Mouse	330	D	X				X	
Cholinergic Modulation of the Amygdala	2407-101317-022118	[redacted]	Mouse, Rat	6258	C, D, E	X					
Data-driven optimization of bioengineered vascular scaffolds as an advanced material for small diameter blood vessel replacement	2408-101319-031418	[redacted]	Rat	160	D	X					
Orexin and insulin modulation of brain aging	2409-101321-031918	[redacted]	Rat	450	D	X		X		X	

Appendix 5: Animal Usage

Project/Protocol Title	IACUC/ OB Number	Principal Investigator	Species	Total Number of Animals Approved	Pain & Distress Category (1)	Special Considerations (use checkmark if applicable)					
						SS (2)	MSS (3)	FFR (4)	PR (5)	HAU (6)	NCA (7)
Maintaining and Restoring Sustainable Hydrology in Iraq	2410-101322-032218	[redacted]	Fish	1111	C, D						
Breeding Colonies for Breast Cancer Studies	2411-101314-032318	[redacted]	Mouse	1839	B, C						
Dendritic cell microRNA-155 and breast cancer	2412-101315-032818	[redacted]	Mouse	1120	B, C, D	X					

(1) If applicable, please provide a description / definition of any pain/distress classification used within this Appendix in the space below. If pain/distress categories are not used, leave blank.
(2) Survival Surgery (SS)
(3) Multiple Survival Surgery (MSS)
(4) Food or Fluid Regulation (FFR)
(5) Prolonged Restraint (PR)
(6) Hazardous Agent Use (HAU)
(7) Non-Centralized Housing and/or Procedural Areas (NCA), i.e., use of live animals in any facility, room, or area that is not directly maintained or managed by the animal resources program, such as investigator laboratories, department-managed areas, teaching laboratories, etc.

Pain/Distress Classification Description/Definition, if applicable:

B: Animals involved in breeding or housing only
C: Procedures involving no pain or distress to the animal
D: Procedures involving pain or distress, or potential pain or distress, to the animal for which anesthetic, analgesic, or tranquilizer is used.
E: Procedures involving pain or distress, or potential pain or distress to the animal for which no anesthetic, analgesic, or tranquilizer is used because of adverse effects on the experimental results.

Appendix 5: Animal Usage

In the Table below, provide an approximate annual usage for all species:

Animal Type or Species	Approximate Annual Use
Laboratory Mice	22,000
Peromyscus spp.	4,800
Fish	2,197

Animal Type or Species	Approximate Annual Use
Swine	100
Guinea pigs	50
Rats	2300

[Create additional rows by pressing TAB in the bottom-right box.]

Appendix 6: Personnel Medical Evaluation Form

Provide a ***blank*** copy of form(s) used by medically-trained personnel to review individual health assessment, individual risk assessment, health history evaluation, health questionnaire, periodic medical evaluation, etc. If form(s) are not used, include a description of how such evaluations are performed in the Program Description (Section 2.I.A.2.b.ii.1).d), Section 2 (Description). I (Animal Care and Use Program). A (Program Management). 2 (Personnel Management). b (Occupational Health and Safety or Personnel). ii (Standard Working Conditions and Baseline Precautions). 1) (Medical Evaluation and Preventive Medicine for Personnel). d).

A Please complete this form, along with form B (Medical History Questionnaire)

Bring all forms to HealthWorks, 1301 Taylor Street, Suite 2H, Columbia, SC 29201
YOU MUST MAKE AN APPOINTMENT BY CALLING 803-296-3500.

University of South Carolina

Risk Assessment Work Evaluation Questionnaire for Employee/Affiliate (participant) with Research Animal Exposure

Appendix 6

Purpose: This form is provided to Principal Investigators (P.I.) or supervisors for the purpose of identifying specific work exposures and potential health hazards in the work environment. This form is used in conjunction with the Medical History Questionnaire for participants with Research Animal Contact to determine what health and safety services or recommendations are appropriate for the individual to work safely with research animals.
Instructions: The P.I. or supervisor must complete the A form for each individual under their supervision with research animal contact. Both the PI and employee/participant must sign the completed A form. The completed A form should be given to the participant. The participant must complete form B and bring both forms (A and B) to HealthWorks of Palmetto Health, 1301 Taylor Street, Suite 2H, Columbia, SC 29201.

SECTION A: Employee or affiliate (participant) information.

Participant Name: ______________________ Job Title: ______________________

Email Address: ______________________ Work Telephone: ______________________

Participant Home Institution: [ ] USC [ ] Other, specify: ______________________

NOTE for non-USC participants: Submit the completed Form A and attach your home institution medical clearance for research animal contact. If a medical clearance form is attached, you do not need to complete Form B. If medical clearance documentation is not attached, you must complete the B form (medical history).

Participant Status (*check all that apply*):

[ ] USC Faculty
[ ] USC Staff
[ ] USC Volunteer
[ ] USC- Graduate Student
[ ] Other:
[ ] Visiting Scientist
[ ] Affiliate
[ ] USC- Undergraduate Student

SECTION B: Principal Investigator/Supervisor information.

P.I./Supervisor Name: ______________________

E-mail Address: ____________ Telephone: ____________ Dept.: ____________

Department Recharge Index# (this is used only for OHSP tracking purposes): ______________________

SECTION C: Must be completed by P.I. / supervisor of employee or affiliate.

	Yes	No
Is animal husbandry an essential part of the participants duties?	☐	☐
Will the participant's animal work involve potential contact with:		
• **Human** blood, tissues or cells administered to or present in animals? Please list (specific type): ______________________	☐	☐
• Infectious agents in animals? *(Including but not limited to virus, bacteria, fungi, protozoa or parasites.)* Please list (names of specific agents): ______________________	☐	☐
• Biosafety level 2 (BSL-2) agents in animals? Please list: ______________________	☐	☐

Appendix C

A

Please complete this form, along with form B **(Medical History Questionnaire)**

Bring all forms to HealthWorks, 1301 Taylor Street, Suite 2H, Columbia, SC 29201
YOU MUST MAKE AN APPOINTMENT BY CALLING 803-296-3500.

SECTION C: continued	Yes	No
• Pregnant mammals *(rodents excluded)*	☐	☐
• Wild-caught animals	☐	☐
• Venomous animals	☐	☐
• Chemicals, including anesthetic gases, in animals. If yes, list: ______________________	☐	☐
• Will you be involved in any off-site animal work (e.g., field work)? If yes, please provide: USC IACUC Protocol#: ____________; List location(s): ______________________	☐	☐

Species Contact: Identify all levels of exposure for each species or tissue for the participant named above and check the appropriate column[s]. Check "0" if no direct or indirect contact. **Check Non-Human primate (NHP) if handling NHP tissue or if participant works in an area where NHP or NHP tissues are housed or handled.**

Level 0 - No animal contact.
Level 1 - No direct contact, but enters area where research animals are used.
Level 2 - Does not conduct procedures on live animals but handles "unfixed" animal tissues and fluids.
Level 3 - Handles, restrains, collection of specimens or administers substances to live animals.
Level 4 - Performs invasive procedures such as surgery, necropsy.

	LEVEL OF EXPOSURE						**LEVEL OF EXPOSURE**				
Species	**0**	**1**	**2**	**3**	**4**	**Species**	**0**	**1**	**2**	**3**	**4**
Amphibian	[ ]	[ ]	[ ]	[ ]	[ ]	Marine Mammal	[ ]	[ ]	[ ]	[ ]	[ ]
Birds	[ ]	[ ]	[ ]	[ ]	[ ]	Mice	[ ]	[ ]	[ ]	[ ]	[ ]
Cat	[ ]	[ ]	[ ]	[ ]	[ ]	Peromyscus spp.	[ ]	[ ]	[ ]	[ ]	[ ]
Cattle	[ ]	[ ]	[ ]	[ ]	[ ]	Poultry	[ ]	[ ]	[ ]	[ ]	[ ]
Dog	[ ]	[ ]	[ ]	[ ]	[ ]	Non-Human Primate	[ ]	[ ]	[ ]	[ ]	[ ]
Ferret	[ ]	[ ]	[ ]	[ ]	[ ]	Rabbit	[ ]	[ ]	[ ]	[ ]	[ ]
Fish	[ ]	[ ]	[ ]	[ ]	[ ]	Rat	[ ]	[ ]	[ ]	[ ]	[ ]
Gerbil	[ ]	[ ]	[ ]	[ ]	[ ]	Reptile	[ ]	[ ]	[ ]	[ ]	[ ]
Goat	[ ]	[ ]	[ ]	[ ]	[ ]	Sheep	[ ]	[ ]	[ ]	[ ]	[ ]
Guinea Pig	[ ]	[ ]	[ ]	[ ]	[ ]	Swine	[ ]	[ ]	[ ]	[ ]	[ ]
Hamster	[ ]	[ ]	[ ]	[ ]	[ ]	Wild- Rabbit/Mice/Rat	[ ]	[ ]	[ ]	[ ]	[ ]
Other	[ ]	[ ]	[ ]	[ ]	[ ]	List: ______________________					

SECTION D: Supervisor certification

By signature, I certify that the information provided is accurate to the best of my knowledge.

______________________________ ______________________
P.I./SUPERVISOR SIGNATURE DATE

By signature, I acknowledge and agree with all of the above.

______________________________ ______________________
EMPLOYEE/PARTICIPANT SIGNATURE DATE

B

Please complete this form, along with form A (Risk Assessment Work Evaluation Questionnaire)

Bring all forms to HealthWorks, 1301 Taylor Street, Suite 2H, Columbia, SC 29201
YOU MUST MAKE AN APPOINTMENT BY CALLING 803-296-3500.

USC School of Medicine
Medical History Questionnaire for Employees / Affiliates with Research Animal Exposure

Appendix 5

Purpose: Employees working with research animals or entering vivaria are required to complete this questionnaire to identify applicable health and safety recommendations. Your answers are confidential. Researchers with indirect animal contact may elect to complete the questionnaire. The purpose of the following questions is to determine if you have any special health needs to work safely with animals. A common health risk includes allergies or respiratory sensitivities which may be caused or aggravated by work around animals. Chronic health conditions, pregnancy, or immune system deficiencies may increase risk of infection from animals (zoonotic disease) or infectious agents used in animals. Chemical exposure from treated animals may also present additional risks during pregnancy or for certain respiratory or chronic health disorders. Based on your answers, medical recommendations will be provided to reduce risk of undesirable health effects and may include wearing additional personal protective equipment or modifying work procedures.

Instructions: Please complete this form and sign below. You must also have a completed form A for submission. To protect your privacy, you must complete form B and either mail in a sealed envelope, fax, or bring both forms A and B to HealthWorks of Palmetto Health, 1301 Taylor Street, Suite 2H, Columbia, SC 29201. Receipt of both forms is required to get medical clearance to work with or around research animals. For an appointment (required), call 803-296-3500.

Section A: General Information

Name (Please Print):	Date of Birth :
Gender: ___ male ___ female	Department:
Telephone:	Email:

1. List animals you will be working with: ____________________

2. Date of last Tetanus vaccine booster: ____________________

3. Have you received a Hepatitis B vaccination series? Yes______ No______

If yes: a) List dates and attach vaccination record: ____________________
b) Did you have a post-vaccination titer , Yes_______ (attach record) No______

4. Do you use or wear any of the following items when working with animals?
Protective Eye Equipment Yes______ No______ **Gloves** Yes______ No______ **Lab Coat** Yes____ No____
Mask/Respirator Yes______ No______
If yes: a) Type of respirator/mask you are using: ________________
b) Have you been fit-tested for a respirator/mask? Yes______ No______ If yes, date of last fit-test: _________

Section B: Employee/Affiliate (participant) Health History

Do you have any of the following medical conditions?

Allergy and Respiratory System Health History		
Yes	**No**	
☐	☐	Asthma or other chronic respiratory disease
☐	☐	Allergic skin reactions such as hives, rash, itching. **If yes, explain:**
☐	☐	Known or suspected animal allergies. **Circle any animal-related reaction(s):** runny/stuffy nose, itching eyes, sneezing, coughing, wheezing, chest tightness, shortness of breath, hives, skin rash, throat swelling. **If yes, list animal(s):** ____________________
☐	☐	Known or suspected allergies to chemicals, latex, food, or environment.

B

Please complete this form, along with form A (Risk Assessment Work Evaluation Questionnaire)

Bring all forms to HealthWorks, 1301 Taylor Street, Suite 2H, Columbia, SC 29201
YOU MUST MAKE AN APPOINTMENT BY CALLING 803-296-3500.

If yes, please list: ______________________________

☐ ☐ Skin conditions such as eczema, psoriasis, dermatitis

Immune/Metabolic System Health History

Yes No

☐ ☐ Chronic health conditions such as Diabetes, Kidney, Liver, or Heart Disease
If yes, please explain: ______________________________

☐ ☐ History of spleen injury or removal of spleen

☐ ☐ Pregnant or planning to become pregnant

☐ ☐ Immune system deficiencies or other limitations to your ability to fight off disease or infection (for example: cancer, lupus, organ transplant, HIV infection, chronic infections)
If yes, please explain: ______________________________

☐ ☐ Current medication or treatment that may suppress your immune system (for example: high-dose or long-term steroid use, cancer therapy, radiation therapy)
If yes, please explain: ______________________________

Appendix

Provider Comments:

____

____

____

____

____

____

____

Attestation and Authorization to Disclose Protected Health Information:

I authorize HealthWorks of Palmetto Health to disclose to the USC Department of Laboratory Animal Resources my clearance to work in the animal facility, enrollment status in the Occupational Health and Safety Program, and information about respirator usage requirements.

The above information is accurate and completed to the best of my knowledge.

Note: There may be increased occupational health risks associated with your job if circumstances change. At any time after completing this questionnaire, if you become pregnant or become aware of a change in your health status or have a change in the species of animal that you are exposed to at work, you are strongly encouraged to contact HealthWorks of Palmetto Health.

______________________________ ____________________
EMPLOYEE/PARTICIPANT SIGNATURE DATE

______________________________ ____________________
REVIEWING CLINICIAN SIGNATURE DATE

C

Please return this completed form to the Department of Laboratory Animal Resources

Return this form to DLAR, GSRC Suite 102, 631 Sumter Street, Columbia, SC 29208

USC Medical Clearance to Work in Animal Research Areas

Purpose: Employees working with research animals or entering vivaria are required to have a risk assessment, health evaluation, and be medically cleared to work in the Department of Laboratory Animal Resources (DLAR). The purpose of this form is to communicate that medical clearance has been granted.

Instructions: Please return the completed to the Department of Laboratory Animal Resources. Bring your Carolina Card so that you can be given access to the facilities.

Name (Please Print):	Department :

1. The above individual underwent a risk assessment and health evaluation. He/she has been advised of the risks associated with working in the Animal Resource Facility and is medically cleared to work. __________ ◆
2. The above individual did/did not (circle one) elect to participate in the Occupational Health and Safety Program. NOTE: participation is required for individuals working with hazardous agents or for those who require the use of a respirator. *Health*Works may also require participation for other reasons at their professional discretion.
3. The above individual does/does not (circle one) require the use of a respirator. If the individual requires a respirator, indicate:

   Brand/type/size of respirator: ______________________________
   To be worn when: ______________________________

Authorization to Disclose Protected Health Information: I authorize *Health*Works of Palmetto Health to disclose to USC Department of Laboratory Animal Resources my enrollment status in the Occupational Health and Safety Program, and information about my respirator usage requirements.

______________________________ ______________ ______________
EMPLOYEE/PARTICIPANT SIGNATURE DATE TIME

______________________________ ______________ ______________
REVIEWING CLINICIAN SIGNATURE DATE TIME

E

This form is for OHSP annual re-evaluation only, NOT initial evaluation.

Bring this form to HealthWorks, 1301 Taylor Street, Suite 2H, Columbia, SC 29201
YOU MUST MAKE AN APPOINTMENT BY CALLING 803-296-3500.

Appendix 6

University of South Carolina

Risk Assessment Work Evaluation Questionnaire for Employee/Affiliate (participant) with Research Animal Exposure

Purpose: This form is provided to personnel enrolled in USCs' Occupational Health and Safety Program for the purpose of re-evaluating an individual's specific work exposures and potential health hazards in the animal research work environment. This form is used in conjunction with the Medical History Questionnaire for participants with Research Animal Contact to determine what health and safety services or recommendations are appropriate for the individual to work safely with research animals.

Instructions: The participant must complete form E and take it to his/her appointment at HealthWorks of Palmetto Health, 1301 Taylor Street, Suite 2H, Columbia, SC 29201. You will receive a new copy of Form C at the end of your appointment.

SECTION A: Employee or affiliate (participant) information.

Participant Name: ____________________ Job Title: ____________________

Email Address: ____________________ Work Telephone: ____________________

Participant Home Institution: [ ] USC [ ] Other, specify: ____________________

Participant Status (*check all that apply*):

- [ ] USC Faculty
- [ ] USC Staff
- [ ] USC Volunteer
- [ ] USC- Graduate Student
- [ ] Other:
- [ ] Visiting Scientist
- [ ] Affiliate
- [ ] USC- Undergraduate Student

SECTION B: Principal Investigator/Supervisor information.

P.I./Supervisor Name: ____________________

E-mail Address: ____________ Telephone: ____________ Dept.: ____________

Department Recharge Index (this is used only for OHSP tracking purposes): ____________________

SECTION C: Must be completed by P.I. / supervisor of employee or affiliate.

	Yes	No
1. Are you still involved in activities associated with live animal care and use? If "NO," sign and return this form to the IACUC office (GSRC 102); your animal facility access will be deactivated. If "YES," complete the remainder of this form.	☐	☐
2. Have you had a change in your health status in the last year? If "YES," please describe the changes so that your occupational risk may be re-evaluated.	☐	☐

E

This form is for OHSP annual re-evaluation only, NOT initial evaluation.

Bring this form to HealthWorks, 1301 Taylor Street, Suite 2H, Columbia, SC 29201
YOU MUST MAKE AN APPOINTMENT BY CALLING 803-296-3500.

---

3. Your animal work or exposures may have changed since your last evaluation. Please mark "YES" or "NO" regarding your current and/or anticipated exposures for the upcoming year. ☐ ☐
   - **Human** blood, tissues or cells administered to or present in animals? ☐ ☐
     Please list (specific type): ______________________
   - Infectious agents in animals? *(Including but not limited to virus, bacteria, fungi, protozoa or parasites.)* ☐ ☐
     Please list (names of specific agents): ______________________
   - Biosafety level 2 (BSL-2) agents in animals? ☐ ☐
     Please list: ______________________
   - Pregnant mammals *(rodents excluded)* ☐ ☐
   - Wild-caught animals ☐ ☐
   - Venomous animals ☐ ☐
   - Chemicals, including anesthetic gases, in animals. If yes, list: ______________________ ☐ ☐
     ____
   - Are you involved in any off-site animal work (e.g., field work)? If yes, please provide:
     USC IACUC Protocol#: ____________; List location(s): ______________________ ☐ ☐

Appendix G

SECTION D: Certification

By signature, I certify that the information provided is accurate. If I am injured or become ill working with animals, it is my responsibility to inform my supervisor and take appropriate action.

______________________ ______________________
EMPLOYEE/PARTICIPANT SIGNATURE DATE

- The above employee was medically re-evaluated based on responses to this form: YES NO
  (Please list any modifications required, such as respirator requirements, below)

- The above employee is cleared to work with live animals: YES NO

______________________ ______________________
REVIEWING CLINICIAN SIGNATURE DATE

OHSP modifications required or suggested (respirator or other PPE, etc.):

Appendix 7: IACUC/OB Membership Roster

Please provide a Committee roster, indicating names, degrees, membership role, and affiliation (e.g., Department/Division).

First	Last	Degree(s)	Membership Role	Affiliation
[redacted]	[redacted]	PhD (economics, retired)	Non-Scientist, non-affiliated	n/a
Shayne	Barlow	DVM, PhD, DACLAM	Veterinarian	DLAR
[redacted]	[redacted]	PhD	Scientist	Pharmacy
[redacted]	[redacted]	PhD candidate	Student Member	SOM - Cell Biology and Anatomy
[redacted]	[redacted]	PhD	Scientist	Biological Sciences
[redacted]	[redacted]	PhD (retired)	Scientist/ Community Member	n/a
[redacted]	[redacted]	PhD	Scientist	SOM - Pharmacology, Physiology, Neuroscience
[redacted]	[redacted]	PhD	Scientist	SOM - Pathology, Microbiology, and Immunology
[redacted]	[redacted]	PhD	Scientist	Biological Sciences
[redacted]	[redacted]	LVT	Scientist (alternate)	DLAR
[redacted]	[redacted]	PhD	Scientist	Mechanical Engineering
[redacted]	[redacted]	PhD	Scientist	Exercise Science
[redacted]	[redacted]	BS, LATg	Scientist	DLAR
Ken	Walsh	PhD	Chair	SOM – Pharmacology, Physiology, and Neuroscience

Appendix 8: IACUC/OB Minutes

Please provide the latest two Minutes of the IACUC/OB meetings.

Appendix 8

UNIVERSITY OF
SOUTH CAROLINA
Office of Research

Institutional Animal Care
and Use Committee

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE
April 5, 2018
Building 3 - Conference Room 225, School of Medicine

The April 5, 2018 meeting of the University of South Carolina Institutional Animal Care and Use Committee (IACUC) was called to order by Dr. Ken Walsh, IACUC Chair, at 3:04pm in Room 225 of Building 3 at the School of Medicine.

Committee Members Present	
Dr. Kenneth Walsh	Chair
Dr. Shayne Barlow	Attending Veterinarian
Committee Member 01	
Committee Member 86	
Committee Member 89	
Committee Member 91	
Committee Member 94	

Consultants and Guests
IACUC Administrator***

*late arrival **early departure ***non-voting

I. APPROVAL OF MINUTES

The committee voted 7-0 to approve the March 2018 minutes.

II. CHAIR'S ANNOUNCEMENTS

Some protocols seem to have a persistent crash issue when doing reviews. The committee discussed this. It is believed to be related to protocols with large Experimental Design narratives.

III. ATTENDING VETERINARIAN'S ANNOUNCEMENTS

1. The department received two FOIA requests from a group known as Ethical Choices, which seems to be an agriculture activist group. The first request was for all animal numbers, and the second was for numbers of teaching animals. There has been no

response since the last communication.

2. DLAR is being assigned a permanent USC police liaison to assist with emergency, disaster, and activist issues.
3. USC may get working dogs for use at events such as football games. DLAR veterinarians and staff will take charge of their health care.

IV. IACUC ADMINISTRATOR'S ANNOUNCEMENTS

1. Semi-Annual Inspections and Program Review Report was circulated for signature.
2. The Program Coordinator has taken a position at another state agency. It is expected that work may slow somewhat.
3. Training. Protocol Review column (Lab Animal, March 2018). The article regarding publication without an IACUC protocol approval was discussed.

V. OLD BUSINESS

A. Status of Proposals Recently Reviewed

2295-101100-032416	Approved by the Designated Reviewer(s).
2297-101114-042216	Approved by the Designated Reviewer(s).
2302-101109-051016	Approved by the Designated Reviewer(s).
2305-101110-051816	In Review.
2307-101116-051816	Approved by the Designated Reviewer(s).
2342-101188-032717	Approved by the Designated Reviewer(s).
2358-101220-051817	Approved by the Designated Reviewer(s).
2362-101221-053117	Approved by the Designated Reviewer(s).
2363-101196-053117	Approved by the Designated Reviewer(s).
2376-101215-081617	Approved by the Designated Reviewer(s).
2383-101273-092117	Approved by the Designated Reviewer(s).
2393-101263-102717	Approved by the Designated Reviewer(s).
101148	Withdrawn for lack of response from PI.
101314	Approved by the Designated Reviewer(s).
101315	Approved by the Designated Reviewer(s).
101319	Approved by the Designated Reviewer(s).
101320	In Review.
101321	Approved by the Designated Reviewer(s).
101322	Approved by the Designated Reviewer(s).

Appendix 8

VI. NEW BUSINESS

A. Annual Reviews

1. Renewals
   Prior to the meeting a list of renewals was sent to the committee in the agenda for review and to request any specific item(s) for further discussion.

Appendix 8

2296-101097-040616	Approved by the Designated Reviewer(s).
2298-101079-042616	In Review.
2299-101045-042716	Approved by the Designated Reviewer(s).
2300-101058-042716	Approved by the Designated Reviewer(s).
2307-101116-051816 (2)	Approved by the Designated Reviewer(s).
2346-101204-041317	Approved by the Designated Reviewer(s).
2347-101199-041717	In Review.
2348-101184-041917	In Review.
2349-101211-041917	In Review.
2351-101206-042017	Approved by the Designated Reviewer(s).

2. Terminations

None.

B. Administrative Amendments

1. Pending

2391-101279-102417	(personnel, fund#)
2406-101308-020618	(personnel, fund#)

2. Approved

2344-101185-032817	(add animal source)
2344-101185-032817 (2)	(location)
2386-101286-100417	(personnel, fund#)
2399-101260-111717	(congruency)

C. New Veterinary Verifications/Consults

2316-101128-083116	In Review.
2328-101171-121916	Approved by the Designated Reviewer(s).
2341-101198-032217	In Review.
2363-101196-053117 (2)	In Review.
2377-101266-082317	In Review.

D. New Designated Member Reviews

1. Pending

None.

2. Assigned

None.

E. Full Committee Reviews

2278-101043-101615	The committee voted 7-0 to require modifications to secure approval. The modifications requested are attached.
2295-101100-032416 (2)	The committee voted 7-0 to require modifications to secure approval. The modifications requested are attached.
2393-101263-102717 (2)	The committee lost quorum and could not conduct an official review. The amendment was returned to the PI without review to address comments made prior to the meeting.

F. Compliance Activity

1. PAM Reports

A. Surgical Proficiencies

None.

B. Other

None.

2. Compliance

A. Follow-up

None.

B. New

None.

VII. OTHER BUSINESS

VIII. NEXT MEETING

The next meeting of the IACUC will be May 3, 2018. The meeting will begin at 3:00 pm in SOM Building 3, Conference Room 225.

IX. ADJOURN

The meeting was adjourned at 3:32pm.

Appendix 8

Reference Number 101043
Review Summary

Section: Amendment Information
Question: Amendment Justification
Comments: Please define PDE11A in terms understandable by someone with a high-school level of education.

Section: Administrative
Question: Protocol Associates
Comments: [Protocol Associate] has not been added to the 'Surgical Personnel' section for the non-survival surgery. Please clarify here if she will only perform survival surgery.

Section: Animals and Procedures
Question: Procedure Description
Comments: 1. Cervical dislocation procedures are covered by IACUC policy, which should be referenced and agreed to (IACUC Policy on Euthanasia by Cervical Dislocation or Decapitation) or, if the procedure will not be performed per policy, any departure(s) should be described and justified.
2. Please describe the procedure for euthanasia by in vivo microwave.

Question: Surgical Personnel Experience
Comments: [Protocol Associate] should be added here if she will participate in the non-survival surgery.

Appendix 8

Reference Number 101100
Review Summary

Section: Animals and Procedures

Question: Breeding Numbers
Comments: This is the Mouse section; P. maniculatus should be placed in the "Peromyscus #1" section.

Question: Animal Number Justification
Comments: Please account for the experimental groups for the new study.

Question: Source of Animals
Comments: In-house breeding is not part of the peromyscus section; will pregnant dams be transferred from AUP 2349-101211-041917?

Question: Description of Experimental Design
Comments: In this section (Experimental Design) it states that the mice will drink 4ml per day, but DOSS treatment is described as an IP injection.
Please clarify if the DOSS is given PO or IP, and then make sure the treatment is in the correct procedure section.

Question: Procedure Description
Comments: 1. Please describe the process for IP injections in pregnant animals. How will it be performed to avoid puncturing the greatly enlarged uterus?
2. Why is DOSS being given IP in these experiments and not orally? Please clarify and/or correct.

Question: Duration and Frequency of the Procedure
Comments: Please add the duration and frequency for DOSS injection. How long does the injection take per animal, and how many times will an animal receive an injection?

Question: Handling of Exposed Items Details
Comments: Will the Peromyscus animals be rehoused in the biohazard caging upon administering the HFD-STZ treatment? If not, where would they be housed during the administration time?

Appendix 8

Reference Number 101263
Review Summary

Section: Amendment Information

Question: Amendment Justification

Comments: 1. Please list all the modifications being requested and why the changes are needed. New mouse strains, additional animals, and a new surgical procedure have been added.
2. Please list the new inhibitors and FDA drugs being added.

Question: Type of Amendment

Comments: Surgery has been added; please also select 'Change of Procedure'.

Section: Animals and Procedures

Question: Authorized Amounts

Comments: For this amendment, 116 category D animals have been added here but 200 category C are requested in the 'Animal Justification' and 'Description of Experimental Design' sections; please modify the numbers and/or the justification for congruency. ◆

Question: Description of Experimental Design

Comments: Please revise to include the newly added surgery.

Question: Surgical Personnel Experience

Comments: Please provide an estimated time frame for personnel to be trained for PDX surgery.

Question: Surgical Procedure

Comments: 1. For the PDX surgery, is 7-10 days too early to remove the skin closures? Please provide additional information.
2. For the PDX surgery, it states that mice will be monitored daily for 3-5 days post surgery; a few sentences later it states the mice will be monitored at least once daily until there are no signs of pain or infection. Please clarify the length of time that the mice will receive daily monitoring post surgery.

Question: Handling of Exposed Items Details

Comments: 1. DLAR SOP 4-13 Hazard Doxorubicin has been rescinded. Please review and reference the current SOPs. State that they will be followed or, if not, describe and justify any departures.
2. Clidox® solution is no longer used by DLAR; "DLAR-approved sterilant" can be used instead, and will cover future changes.

Appendix 8

UNIVERSITY OF
SOUTH CAROLINA
Office of Research

Institutional Animal Care
and Use Committee

Appendix 8

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE
June 7, 2018
Building 3 - Conference Room 225, School of Medicine

The June 7, 2018 meeting of the University of South Carolina Institutional Animal Care and Use Committee (IACUC) was called to order by Dr. Ken Walsh, IACUC Chair, at 3:02pm in Room 225 of Building 3 at the School of Medicine.

Committee Members Present	
Dr. Kenneth Walsh	Chair
Dr. Shayne Barlow	Attending Veterinarian
Committee Member 01	
Committee Member 45	
Committee Member 86	
Committee Member 91	
Committee Member 95	

Consultants and Guests
IACUC Administrator***

*late arrival **early departure ***non-voting

I. APPROVAL OF MINUTES

The committee voted 7-0 to approve the April 2018 minutes.

II. CHAIR'S ANNOUNCEMENTS

There were no announcements.

III. ATTENDING VETERINARIAN'S ANNOUNCEMENTS

1. The temperature and humidity issues persist. It was discovered that Maintenance's sensors are placed at the supply end of the system, and DLAR's sensors are placed at the exhaust end. This would account for the differences in readings and ability for Maintenance to make adjustments. Supply-end sensors will be moved to the exhaust end in the next few weeks.

IV. IACUC ADMINISTRATOR'S ANNOUNCEMENTS

1. Semi-Annual Inspections and Program Review Report was circulated again for signature.
2. The new OHSP Form E (annual update) form was discussed. It has been mailed out to renewing personnel since May.
3. Training. Protocol Review column (Lab Animal, November 2010). An article regarding Renewal of expired protocols was discussed.
4. An email poll will be sent out to select a day for the IACUC's annual Retreat Luncheon.
5. Because the July IACUC meeting falls the day after a University holiday just prior to a weekend, the committee voted 7-0 to reschedule the meeting to July 12th.

V. OLD BUSINESS

A. Status of Proposals Recently Reviewed

VI. NEW BUSINESS

A. Annual Reviews

1. Renewals
Prior to the meeting a list of renewals was sent to the committee in the agenda for review and to request any specific item(s) for further discussion.

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2301-101113-050416	Approved by the Designated Reviewer(s)
2305-101110-051816 (2)	Approved by the Designated Reviewer(s)
2306-101120-051816	Approved by the Designated Reviewer(s)
2308-101123-052316	Approved by the Designated Reviewer(s)
2309-101131-052416	In Review.
2312-101138-072516	Approved by the Designated Reviewer(s)
2352-101175-050117	In Review.
2353-101209-051017	Approved by the Designated Reviewer(s)
2356-101213-051817	Approved by the Designated Reviewer(s)
2359-101212-052417	Approved by the Designated Reviewer(s)
2364-101193-060217	Approval pending.
2365-101250-062917	Approved by the Designated Reviewer(s)
2366-101252-071217	Approval pending.
2370-101265-072617	Approved by the Designated Reviewer(s)
2371-101254-072617	Approved by the Designated Reviewer(s)
2372-101257-073117	Approved by the Designated Reviewer(s)
2374-101258-080217	Approval pending.
2376-101215-081617	In Review.
2377-101266-082317 (3)	In Review.
2379-101225-083117	Approval pending.

2. Terminations

2298-101079-042616	There was no response from the PI; terminated administratively.
2304-101112-051116	Termination requested by the PI.
2354-101194-051217	Approved by the Designated Reviewer(s).

B. Administrative Amendments

1. Pending

2265-101025-081115 (2)	(personnel only)
2283-101072-011316	(personnel only)
2317-101133-090716	(personnel only)
2326-101166-121516	(personnel only)

2. Approved

2268-100995-082615	(personnel only)
2281-100965-121115	(personnel only)
2302-101109-051016	(personnel only)
2307-101116-051816	(personnel only)
2307-101116-051816	(fund, personnel)
2324-101167-120116 (2)	(personnel only)
2332-101169-020917	(personnel only)
2335-101179-022817	(fund only)
2339-101187-030817	(fund only)
2341-101198-032217 (2)	(personnel only)
2342-101188-032217	(personnel only)
2345-101192-032817	(personnel only)
2346-101204-041317	(personnel only)
2355-101205-051517	(personnel only)
2357-101217-051817	(personnel only)
2358-101220-051817	(personnel only)
2361-101216-052517	(fund only)
2363-101196-053117	(personnel only)
2367-101253-071817	(personnel only)

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2383-101273-092117	(personnel only)
2384-101261-092817	(personnel only)
2411-101314-032318	(personnel only)
2412-101315-032818	(vendor, fund)

C. New Veterinary Verifications/Consults

2328-101171-121916	Approved by the Designated Reviewer(s).
2349-101211-041917 (3)	In Review.
2407-101317-022118	Approved by the Designated Reviewer(s).

D. New Designated Member Reviews

1. Pending

None.

2. Assigned

2325-101159-121416	In Review.
2281-100965-121115	Approved by the Designated Reviewer(s).
2324-101167-120116	Withdrawn by the PI.
2401-101292-112817	Approved by the Designated Reviewer(s).
2323-101158-111816	Approved by the Designated Reviewer(s).
2277-101062-101615	Approved by the Designated Reviewer(s).
2274-101041-100715	In Review.
2271-101040-091815	In Review.
2269-101023-083115	Approved by the Designated Reviewer(s).
2377-101266-082317 (2)	Approved by the Designated Reviewer(s).
2265-101025-081115	Approved by the Designated Reviewer(s).
2311-101094-072516	Approved by the Designated Reviewer(s).

2300-101058-042716	In Review.
2299-101045-042716	Approved by the Designated Reviewer(s).
2349-101211-041917 (2)	Approved by the Designated Reviewer(s).
2412-101315-032818 (2)	Approved by the Designated Reviewer(s).
2344-101185-032817	Approved by the Designated Reviewer(s).
2340-101195-031317	Approved by the Designated Reviewer(s).
2335-101179-022817	Approved by the Designated Reviewer(s).
101326	In Review.
101327	Approved by the Designated Reviewer(s).
101332	Approved by the Designated Reviewer(s).

Appendix 8

E. Full Committee Reviews

101092	The committee voted 7-0 to require modifications to secure approval. The modifications requested are attached.
101329	The committee voted 7-0 to withhold approval of the protocol. A new submission must incorporate the attached changes.
101333	The committee voted 7-0 to require modifications to secure approval. The modifications requested are attached.

F. Compliance Activities

1. PAM
    - A. Surgical Proficiencies
        1. 2318-101144-090716
        2. 2307-101116-051816
        3. 2263-101002-071715
        4. 2344-101185-032817
    - B. Other
2. Compliance
    - A. Follow-up
    - B. New

VII. OTHER BUSINESS

A. Resolving AUPs that crash due to excessive narrative. In order to attempt resolution, a dummy protocol will be created using one of the problem protocols. It will be used to experiment with a means of resolving the problem.

VIII. NEXT MEETING

The next IACUC meeting is scheduled for July 12, 2018 at 3:00 pm in SOM Building 3, Conference Room 225.

IX. ADJOURN

The meeting adjourned at 3:35 pm.

Appendix 8

Reference Number 101092
Review Summary

Section: Administrative

Comments: The committee strongly suggests that the PI revise this protocol with assistance from the IACUC office. Please call 777-8106 for assistance and to schedule an appointment.

Question: Accounts

Comments: Please add the account number for the federal grant listed below. If the account is not yet set up, use Account Pending and amend the protocol when it is. If the account is set up but not available on the drop-down list, contact [redacted] to have it added.

Question: Protocol Associates

Comments: [redacted] needs to register with the AALAS Learning Library and complete the training required per the IACUC training policy.
http://sam.research.sc.edu/animalcare/pdf/training_personnel.pdf

How to access online modules:
a. Personnel will go to: https://www.aalaslearninglibrary.org
b. Personnel will select "Subscribe" located on the top right of the main page.
c. Personnel will select "Yes" for Access Code question.
d. Personnel will register using the access code <USCtraining>. Complete requested information, i.e. name, username, password, etc.
e. Personnel should log out and log back in. Personnel should be prompted to complete their profile page. Personnel may also update their profile by selecting 'My Profile' from the drop-down menu at the top right under the user's name to provide the required information including the PI and USC Billing fund information. There is a one-time account fee that will be charged to the Principal Investigator.
f. An email will be sent to notify the personnel when they have been accepted into the USC group. The personnel may then begin completing modules.

Question: Occupational Health and Safety

Comments: If the PI has not yet done so, please complete the OHSP risk assessment, which is required to obtain animal facility access.

Section: Animals and Procedures

Question: Strains Not Listed

Comments: Delete the strains here and select them from above.

Question: Authorized Amounts

Comments: Revise this section, the Animal Number Justification, and the Breeding Numbers table for congruency.

Question: Breeding Numbers

Appendix 8

Comments: Please complete the table and ensure that the numbers here are congruent with those in the Animal Number Justification and the Authorized Amounts section.

Question: Description of Experimental Design

Comments:

1. Please complete the section with the requested information in the instructions. Remove superfluous information. Attachments should enhance, not replace, the narrative.
2. Please provide monitoring frequency and specific endpoint criteria that will be used to determine when an animal will be removed from the study.
3. Please note that the Attending Veterinarian is authorized by the university to treat or euthanize animals without prior consent of the PI. The statements in this narrative requiring PI approval are not congruent with institutional policy. Please revise.

Question: Chemical Euthanasia Agents

Comments:

1. Should this be 100 mg/kg?
2. Sigma does not provide pharmaceutical grade compounds. Please provide a vendor of pharmaceutical-grade compounds.

Question: Procedures

Comments:

1. Include all procedures listed in the Experimental Design Section, including subcutaneous injections.
2. All experimental agents and vehicles should be accounted for under the appropriate procedure.
3. DMSO is not listed in the protocol.

Question: Procedure Description

Comments: Please provide a detailed description of IP injection. Here is an example of a procedure description for IP injections:

"Pick up the mouse by the tail from the cage. With the free hand, clasp the mouse firmly from the back of the neck with the thumb and index finger, clasp the tail between inside of the palm and fourth and fifth finger and hold the animal with its ventral (belly) side facing the investigator. For injection use a 26 gauge, 1" injection needle. With the other hand hold the syringe-needle containing the injection mate. Insert the needle into the skin surface at an angle approximately 45 degrees to the left or right of the mouse's midline into its peritoneal cavity. Aspirate to verify that needle is not in blood vessel or intestines.Without changing the position or angle of the syringe/needle, very carefully, holding the animal and syringe very still push the plunger of the syringe to inject the required amount of the material. The injection volume should not exceed 0.05 -1.5ml. Remove the needle. Clean the site of injection with a swab of 70% alcohol and place the animal back in the cage."

Question: Experimental Agent Table

Comments: This section pertains to experimental agents administered via IP injection. The compounds here are listed as being given via oral gavage.

Please remove them from this section and put them in the section for oral gavage, and include these modifications.

1. Please correct to "pregnant dams".
2. Provide the amount of saline to be used as vehicle.
3. Sigma does not provide pharmaceutical grade compounds. Please find a vendor of pharmaceutical-grade compounds, or add this to the Non-Pharmaceutical Grade Compounds section and provide scientific justification.

Question: Procedure Description
Comments:

1. Please provide a description of the procedure.
2. How will death be assured after Nembutal administration prior to perfusion?

Question: Anesthetic Table
Comments:

1. Sigma does not provide pharmaceutical grade compounds. Please provide a vendor of pharmaceutical-grade compounds.
2. This is a different dose from what is listed in the euthanasia section under chemical euthanasia agents. Please revise one or the other for congruence.

Question: Procedure Description
Comments: Please add a description of the oral gavage, for example: "The mouse is restrained by grasping the skin over the shoulders with the thumb and middle fingers so that the 2 forelegs are extended out to the side, keeping the front feet from pushing the gavage tube away. The animal's head is held in place by gently extending the head back creating a straight line through the neck and esophagus. A 20-gauge gavage tube is placed in the mouth and gently advanced along the upper palate until the esophagus is reached. Care is taken that the tube is passed smoothly in one motion. If there is any resistance, the tube will not be forced; it will be taken out and the procedure tried again. Once proper placement is verified, the drug (INDICATE DOSE) will be administered by a syringe attached to the end of the tube being careful not to rotate the tube to avoid rupture the esophagus. A maximum of 200-250 uL of drug will be administered depending on the weight of the mouse. After dosing, the tube is removed gently following the same angle as insertion. The animal is returned to the cage and monitored for 5-10 minutes, looking for signs of labored breathing or distress. Animals are monitored again between 12-24 hours after dosing."

Question: Experimental Agents/Diets
Comments: Please select "yes" and fill out this section with the experimental agents that will be delivered by oral gavage.

Question: Survival Surgery Location
Comments: This is a large animal surgery room. Please select another location, such as the [redacted] procedure room.

Question: Surgical Procedure

Comments: Include the suture type and size.

Question: Instrument Sterilization
Comments: How many surgeries would be performed before the instruments are re-autoclaved? Usually, one set of surgical instruments is used for no more than more than 5 animals.

Question: Postoperative or Preemptive Analgesics
Comments:

1. Sigma does not provide pharmaceutical grade compounds. Please provide a vendor of pharmaceutical-grade compounds.
2. Please also add "and as needed" to the frequency of administration, to avoid potential non-compliance.

Question: Postoperative Monitoring and Care
Comments: Please state when sutures will be removed.

Question: Removal from the Department of Laboratory Animal Resources
Comments: Animals should not be removed from the facility for more than 12 hours. Justification for 12 or more hours must be provided.

Question: Hazardous Agents
Comments: Where is tamoxifen in the experiment?

Question: Handling of Exposed Items
Comments: Select "Yes" and complete the section.

Section: Pharmaceutical Grade Compounds
Question: Pharmaceutical Grade Compounds
Comments: Please select "No" and complete the section for all non-pharmaceutical grade compounds being used.

Appendix 8

Reference Number 101329
Review Summary

Section: Administrative
Question: Principal Investigator
Comments: [redacted] needs to register with the AALAS Learning Library and complete the training required per the IACUC training policy: http://sam.research.sc.edu/animalcare/pdf/training_personnel.pdf

How to access online modules:

a. Personnel will go to: https://www.aalaslearninglibrary.org
b. Personnel will select "Subscribe" located on the top right of the main page.
c. Personnel will select "Yes" for Access Code question.
d. Personnel will register using the access code <USCtraining>.Complete requested information, i.e. name, username, password, etc.
e. Personnel should log out and log back in. Personnel should be prompted to complete their profile page. Personnel may also update their profile by selecting 'My Profile' from the drop-down menu at the top right under the user's name to provide the required information including the PI and USC Billing fund information. There is a one-time account fee that will be charged to the Principal Investigator.
f. An email will be sent to notify the personnel when they have been accepted into the USC group. The personnel may then begin completing modules.

Question: Accounts
Comments: The grant for account FA71 expired January 2018. Please update the information and the associated grant as needed.

Appendix

Section: Project Information
Question: Title
Comments: Please correct the spelling of "inflammation."

Question: Grant Title
Comments: Please provide the complete grant title.

Question: Grant Number
Comments: This is a USC account number, not the sponsor's assigned grant number. Please provide the NIH grant number.

Section: Study Objectives
Question: Lay Summary
Comments:

1. The first sentence is incomplete. Please rewrite to include a verb.
2. The sentence that begins with "epidemiology" should be followed by studies, not study.

Section: Animals and Procedures
Question: Category E Justification

Comments: Are the animals in Cat E because of the stress of the procedure or the inflammatory food? An inflammatory diet is unlikely to be category E. Please clarify assignment of animals to category E.

Question: Animal Number Justification
Comments: Please clarify this sentence: 30 min to 1hr per day, at least times per week.

Question: Source of Animals
Comments: Please select or deselect the appropriate items.

Question: Transfer Information
Comments: This AUP has expired, please up date with 2369-101242-072617.

Question: Description of Experimental Design
Comments:

1. Please revise this section for clarity, paying particular attention to incomplete sentences.
2. Any standard procedures described below should be clearly included in this section.
3. Any procedures described here should be included in the Standard Procedures section.
4. In Part A, please specifically describe the altered light cycle or intensity.
5. The description of clinical endpoints is not clear. Please revise for clarity to describe what criteria would be used to determine when an animal would be prematurely removed from the study.
6. Include a description of monitoring frequency. Once a week is not sufficient for Category E studies.
7. What constitutes "a lot" of holes in the restraint tube? Why isn't a commercially available device used?

Question: Procedures
Comments: A number of these procedures are not included in the Experimental Design section. Please revise for clarity on congruency.

Question: Experimental Agent Table
Comments: These treatments are not included in the experimental design section nor in the animal number justification section. Please clarify.

Question: Location
Comments: Macrophage depletion using clodronate is not described in the experimental design section nor in the animal number justification section. Please clarify.

Question: Non-Standard Procedures
Comments: This is not described in the Experimental Design section. Please clarify.

Question: Restraint
Comments: Animals are being restrained. Select "Yes" and answer the questions.

Prolix8

Question: Hazardous Agents

Comments: Please check 'Yes'; Azoxymethane (AOM), 4-Ethoxymethylene-2-phenyl-2-oxazolin-5-one, and Dextran Sulfate are all labeled as hazards in the experimental agents tables.

Section: Pharmaceutical Grade Compounds

Question: Non-Pharmaceutical Grade Compounds

Comments: All non-pharmaceutical-grade compounds in the study must be listed here and scientific justification given.

Appendix 8

Reference Number 101333
Review Summary

Section: Administrative
Question: Protocol Associates
Comments: All associates are up to date with their AALAS training. [redacted]s due for re-training and has been notified.

Section: Animals and Procedures
Question: Authorized Amounts
Comments: Adjustment number carried over from previous AUP needs to be removed post approval.

Question: Description of Experimental Design
Comments:

1. For each group, please provide a description of clinical endpoints that would result in a removal from the study and a description of how often the animals would be monitored for those criteria.
2. The first paragraph requests single housing without environmental enrichment, but the first sentence here says "rats are to be provided enrichment such as Nylabone for their enjoyment". Is this a statement from the enrichment SOP and the lab is then providing justification for not using the enrichment? Please clarify whether or not environmental enrichment is being requested.

Question: Procedure Description
Comments: Why wait for signs of recovery before administering pain meds? Why not give them before surgery starts?

Question: Surgical Procedure
Comments: In the first sentence of the third paragraph, "jugular catheterization" the word "next" should be "neck."

Question: Postoperative or Preemptive Analgesics
Comments: Again, why is carprofen given post-surgery and not before?

Appendix 9: IACUC/OB Protocol Form

Please attach a ***blank*** copy of form(s) used by the IACUC/OB to review and approve studies. Include forms used for annual (or other periodic) renewal, modifications, amendments, etc., as applicable.

Note: The University of South Carolina uses an online submission and review process and the form does not translate well to paper. The online form expands depending on the answers provided by the PI. The expansion often includes additional information and/or instructions. Upon completion, the PI has usually completed a 20-30 page document. However, when every possible question is printed for every possible species, the result is a 632-page document.

For review purposes, the following form has been printed with only a single species to reduce the document's size. This will allow the site visitors to see all the possible questions without having to sort through 632 pages to review them.

If the site visitors prefer, we can provide them with a log on ID and password to view the AUP form online.

Blank Form Report

Printed By: Barlow, Shayne C.
6/15/2018 3:31:55 PM

Report Comments

JP Form

ninistrative

erence Number — System Generated — 1.1

is is a system-generated number used to identify your request. This is not the AUP number. The AUP number will be signed when the protocol is approved.

---

ncipal Investigator — System Generated — 1.2

Appendix 9

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counts — System Generated — 1.3

ease select all accounts that may be used for billing per diems and animal orders. If your account is not listed, please ntact DLAR at 777-8106 to have it added.

partment — System Generated — 1.4

ease select the primary faculty appointment for the Principal Investigator.

---

ergency Contact Information — 1.5

ease provide the name and phone number for the person to be contacted in the event of an emergency. Please do not vide an office number. This should be a number useful during nights, weekends, and holidays.

---

hor — System Generated — 1.6

rson writing the protocol. This can be individuals other than the Principal Investigator.

---

tocol Associates — System Generated — 1.7

ease list all personnel that will participate in the work proposed. Use the green plus sign to the right to add Protocol sociates. If the person is not on the list, please contact DLAR at 777-8106. Under "Comments", please summarize the perience/training of the individual as it relates to his/her duties on this proposal.

cupational Health and Safety — 1.8

ichments: OHSP Form A.pdf OHSP Form B.pdf

personnel must be cleared to work with animals before gaining access to the animal facility. Form A should be npleted by the PI and Form B should be completed by the individual. The completed forms are to be brought to the lividual's appointment at Healthworks of Palmetto Health, 1333 Taylor Street, Suite 3H, Columbia, SC 29201. YOU JST MAKE AN APPOINTMENT. WALK INS ARE NOT ACCEPTED. If the individual is cleared to work with animals, the ysician will complete Form C, which is returned to DLAR. DLAR will then provide key card access to the facility.

Appendix 9

ated By System Generated 1.9

---

tinuation 1.10

his submission a continuation of a previously approved AUP?

Yes

No

1.10.1

viously Approved AUP number 1.10.1.1

ase provide the AUP number for the AUP that you wish to continue.

---

tinuation Update 1.10.1.2

ovide a short description of the previous animal use, the number of animals used, and justify the need to request ditional animals to continue/complete the project. DO NOT REVISE THIS SECTION AS PART OF AN ANNUAL VIEW (RENEWAL).

1.10.2

ject Information

e System Generated 2.1

ter the project title.

---

ramural Funding 2.2

his project supported by current or pending extramural funding?

Yes

No

2.2.1

ding Source 2.2.1.1

ase select all that apply. Use the green plus sign to the right to select funding source(s).

nding Source

Appendix 9

---

ntify 'other' funding source. 2.2.1.2

he funding source was not listed above, please state the funding source here.

ınt Title 2.2.1.3

ɜase provide the grant title(s) as submitted to the identified funding agency.

ınt Number 2.2.1.4

ɜase provide the funding agency's assigned grant number.

2.2.2

dy Objectives

' Summary 3.1

efly explain in language understandable to a layperson the aim of the study and why the study is important to human animal health, the advancement of knowledge, or the good of society.

---

imals and Procedures

ɜcies Selection 4.1

e the green plus sign to the right to add species. If your species is not listed, please contact Animal Resource cilities at 777-8106 to have them added PRIOR to continuing with this form.

4.1.1

ıse (Laboratory)

ain/Stock/Breed System Generated 4.1.1.1

ɜase select the strain(s) to be used. Use the green plus sign to the right to add strains. Please note that for some ɜcies there are MULTIPLE PAGES of strains to choose from. For best results, search the list by Jackson Laboratory ıck number.

ains Not Listed 4.1.1.2

'our strain is not listed in the section above, type it here. Please do not use this section for strains that are listed above it will delay approval.

:horized Amounts System Generated 4.1.1.3

e the green plus sign to the right to add animal numbers by USDA Pain and Distress Categories. You can add more ın one stress category by pushing the green plus sign again. For definitions of the USDA Pain and Distress Categories, ǝ the help button to the right of each category. This section should include ALL animals to be used, ordered, bred, etc.

---

egory E 4.1.1.4

ll animals be placed in Category E? Category E is for animals that are subjected to painful or stressful procedures hout the use of anesthetics, analgesics, or tranquilizers. Withholding of anesthetics, analgesics, or tranquilizers can ly
allowed if it is scientifically justified in writing and approved by the IACUC. Examples of category E procedures are ıal dose studies (e.g. LD50 studies) that allow animals to die without intervention, pain studies that would not be ssible if pain-relieving agents were administered, and psychological conditioning experiments that involve painful ıuli such as a noxious electrical shock that cannot immediately be avoided by an animal.

Yes

No

4.1.1.4.1

Appendix 9

egory E Justification 4.1.1.4.1.1

ǝase explain why the animals are placed in Category E and provide a scientific justification for not using anesthetics, algesics, tranquilizers or experimental design to prevent their placement in Category E.

---

ath as an End Point 4.1.1.4.1.2

ll death be an endpoint in any of the animals in this proposal? Death as an Endpoint is strongly discouraged and ually not necessary. Clinical criteria such as weight loss, mobility, and hypothermia can usually permit inerventional thanasia and prevent the necessity of using death as an edpoint.

Yes

No

4.1.1.4.1.2.1

ıtification for Death as an Endpoint 4.1.1.4.1.2.1.1

ǝase provide compelling scientific justification for using death as an endpoint.

4.1.1.4.1.2.2

4.1.1.4.2

Appendix 9

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mal Number Justification 4.1.1.5

ovide a detailed justification for the number of animals used over the course of study or the three year approval period. lude a description of each experimental and control group of animals. The use of tables or charts is recommended to olain each group. Use the paperclip symbol to the right to attach documents. Explain how groups sizes were termined. A power analysis should be used to substantiate the numbers requested.

---

using Site(s) 4.1.1.6

ease indicate the site(s) where animals will be housed. Use the green plus sign to the right to add housing site(s).
ousing Sites

urce of Animals 4.1.1.7

oose one (or more as appropriate) to indicate the source of the animals to be used.

Commercial Vendor
Transfer from another USC AUP
Transfer from another institution
In-house breeding (as part of this protocol)
Capture from the wild (Details should be included in the "Field Studies" section)

4.1.1.7.1

nmercial Vendor 4.1.1.7.1.1

ease select the vendor(s) from this list below. Use the green plus sign to the right to add commercial vendor(s). If your nmercial vendor is not listed, please contact DLAR at 777-8106
endor

4.1.1.7.2

nsfer Information 4.1.1.7.2.1

r animals being transferred, provide the specific strains, the originating AUP number and PI name. This will require npletion of an Animal Transfer Request form PRIOR to transfer of animals.

4.1.1.7.3

titution Identity 4.1.1.7.3.1

ease provide the name of the institution from which the animals will originate.
imals from unapproved vendors must first get approval for transfer from the DLAR veterinarian. An animal order form ist be submitted with the name of the institution, contact person and contact information. If animals are accepted by the F veterinarian, animals must undergo a period of quarantine.

4.1.1.7.4

Appendix 9

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eding Justification 4.1.1.7.4.1

nimals will be bred in house, provide a justification. Appropriate justification would be the need to perpetuate a netically manipulated rodent strain or the maintenance of strains not available commercially. List the anticipated tcome of the genetic manipulation (e.g. tumorigenesis, tissue ablation, enzyme deficiency, other). Please note that cost ne is not adequate justification for in-house breeding.

---

enotype Management 4.1.1.7.4.2

ase describe any special care, monitoring or husbandry conditions that will be necessary (special caging, type of dding, etc.) Describe any expected health issues in the breeders or the offspring. Include a description of how any in or distress associated with the animals will be monitored and managed.

---

ting System Description 4.1.1.7.4.3

ase describe the mating system (male/female ratio, inbreeding/random mating, etc.) to be used. Flow charts and/or igrams may be attached using the paperclip symbol to the right. Harem breeding must be specifically justified. Please e the USC Institutional Policy on Mouse Cage Density and The Guide for the Care and Use of Laboratory Animals for re information.

---

cord Keeping 4.1.1.7.4.4

ase describe the record keeping system that will be used. It is recommended that a sample record-keeping sheet be ached. Use the paperclip button to the right to attach documents.

---

eding Numbers 4.1.1.7.4.5

ase complete ALL information on the table below. Strain names must match the strain names above or the review of s proposal will be delayed. Use the plus sign to add rows. Scroll all the way across the screen to fill in all sections.

in	JAX stock # (if applicable)	# of Breeders	# of Offspring Weaned	# of Offspring Used for Experiments

---

otyping Method 4.1.1.7.4.6

e the green plus sign to the right to select genotyping method(s) to be used.

enotyping
ocedures

4.1.1.7.5

Appendix 9

scription of Experimental Design 4.1.1.8

efly explain the experimental design and provide a complete description of all experimental procedures that will be rformed on the animals. This description should allow the IACUC to fully understand the experimental course of an imal or group of animals from its entry into the experiment to the endpoint of the study. Flow charts, diagrams, and/or oles are greatly encouraged and can be attached using the paperclip button to the right. Please list all abbreviations to used.

amples of what should be addressed include:

Experimental injections or inoculations (specifics should be included under Standard Procedures, but provide enough tail so that the experimental design is clear).

Blood withdrawals (specifics should be included under Standard Procedures, but provide enough detail so that the perimental design is clear).

Surgical procedures (specifics should be included under Surgical Procedures, but provide enough detail so that the perimental design is clear).

Radiation (dosage and schedule).

Methods of restraint (e.g., restraint chairs, collars, vests, harnesses, slings, etc.).

Other procedures (specifics should be included under Non-Standard Procedures, but provide enough detail so that the perimental design is clear).

Resultant effects, if any, that the animals are expected to experience (e.g., pain or distress, ascites production, etc.).

Other potential stressors (e.g., food or water deprivation, noxious stimuli, environmental stress) and procedures to onitor and minimize distress. If a study is USDA Classification E, indicate any non-pharmaceutical methods to minimize in and distress.

Experimental endpoint criteria (e.g., tumor size, percentage body weight gain or loss, inability to eat or drink, havioral abnormalities, clinical symptomatology, or signs of toxicity) must be specified when the administration of tumor ls, biologics, infectious agents, radiation or toxic chemicals are expected to cause significant symptomatology or are tentially lethal. List the criteria to be used to determine when euthanasia is to be performed.

. Veterinary care (indicate desired plan of action in case of animal illness, e.g., initiate treatment, call investigator prior initiating treatment, euthanize).

---

hanasia Methods System Generated 4.1.1.9

e the green plus sign to the right to select euthanasia methods.

emical Euthanasia Agents 4.1.1.10

ı chemical agent is used for euthanasia, please specify the agent, the dosage and the route of administration. Use the ıs sign to add rows. Scroll all the way across the screen to fill in all sections.

nt	Dosage	Route	Source (Must be pharmaceutical grade)

MA Guidelines 4.1.1.11

ıchments: https://www.avma.org/KB/Policies/Documents/euthanasia.pdf

he method(s) of euthanasia include those not recommended by the AVMA Panel Report on Euthanasia (e.g., capitation or cervical dislocation without anesthesia), provide scientific justification why such methods must be used. A ‹ to the AVMA Panel on Euthanasia is provided.

Appendix 9

cedures System Generated 4.1.1.12

andard Procedures are procedures that are routinely performed in research animals, such as injections, administration special diets, behavioral studies, exercise studies, etc. These procedures should be described in the above xperimental Design" section with enough detail that the experimental design can be understood. Here, you should ovide the specifics. If a procedure you wish to perform is not included in the list, then use the "Non-Standard ocedures" section for that procedure. Use the green plus sign to the right to add Standard Procedures.

cation 4.1.1.12.1

ease select the room(s) where the procedure will be performed.

cations (Surgery
d Procedure)

cedure Description 4.1.1.12.2

ease describe in detail the procedures to be performed on laboratory animals. Please do not include any details about entific methods that do not directly involve the use of animals (such as assays performed on tissue or blood obtained m animals or measurements on the materials to be administered-that information should be included in the perimental Design section).

---

ation and Frequency of the Procedure 4.1.1.12.3

ease indicate the duration and frequency of the procedure.

---

erimental Agents/Diets 4.1.1.12.4

ll experimental agents be administered as part of this procedure? This section is for agents administered to the animal part of the proposed experiments, but does not include "veterinary care" drugs such as anesthetics, analgesics, etc.

Yes

No

4.1.1.12.4.1

erimental Agent Table 4.1.1.12.4.1.1

ease complete for each experimental agent administered as part of this procedure. Use the plus sign to add rows. roll all the way across the screen to fill in all sections.

nt Name	Route of Administration	Dose/Volume	Frequency	Hazard (Yes or No)	Source of Agent/Diet

---

4.1.1.12.4.2

Appendix 9

---

esthetics Used 4.1.1.12.5

ll anesthetics be used for this procedure?

Yes

No

4.1.1.12.5.1

esthetic Table 4.1.1.12.5.1.1

ease complete a row for each anesthetic agent administered as part of this procedure. Use the plus sign to add rows. roll all the way across the screen to fill in all sections.

sthetic Name	Route of Administration	Dose	Frequency	Purpose for Use (Pre-op, anesthetic, etc)	Source of Anesthetic

---

nitoring of Anesthetic Depth 4.1.1.12.5.1.2

ease select all methods listed that will be used to monitor anesthetic depth.

esthetic Depth
iteria

4.1.1.12.5.2

algesics Used 4.1.1.12.6

ll analgesics be used for this procedure?

Yes

No

4.1.1.12.6.1

algesic Table 4.1.1.12.6.1.1

ease complete a row for each analgesic agent administered as part of this procedure. Use the plus sign to add rows. roll all the way across the screen to fill in all sections.

lgesic Name	Route of Administration	Dose	Frequency of Administration	Source of Analgesic

---

4.1.1.12.6.2

ier Therapeutic Drugs 4.1.1.12.7

ll other therapeutic drugs be used for this procedure? This does not include Experimental Agents. An example would antibiotics.

Yes

No

Appendix 9

4.1.1.12.7.1

er Therapeutic Drugs 4.1.1.12.7.1.1

ase complete a row for each therapeutic drug administered as part of this procedure. Use the plus sign to add rows. roll all the way across the screen to fill in all sections.

g name	Route of Administration	Dose	Frequency	Source of Drug

4.1.1.12.7.2

-Standard Procedures 4.1.1.13

ll procedures not listed under "Standard Procedures" be performed?

Yes

No

4.1.1.13.1

ation 4.1.1.13.1.1

ase select the room(s) where the procedure will be performed.

cations (Surgery
d Procedure)

cedure Description 4.1.1.13.1.2

ase describe in detail the procedures to be performed on laboratory animals. Please do not include any details about entific methods that do not directly involve the use of animals (such as assays performed on tissue or blood obtained m animals or measurements on the materials to be administered).

---

ation and Frequency of the Procedure 4.1.1.13.1.3

ase indicate the duration and frequency of the procedure.

---

sthetics Used 4.1.1.13.1.4

ll anesthetics be used for this procedure?

Yes

No

4.1.1.13.1.4.1

Appendix 9

---

esthetic Table 4.1.1.13.1.4.1.1

ease complete a row for each anesthetic administered as part of this procedure. Use the plus sign to add rows. Scroll the way across the screen to fill in all sections.

sthetic Name	Route of Administration	Dose	Frequency	Purpose for Use (Pre-Op, Anesthetic, etc)	Source of Agent

---

nitoring of Anesthetic Depth 4.1.1.13.1.4.1.2

ease select all criteria that will be used to monitor anesthetic depth.

esthetic Depth
iteria

4.1.1.13.1.4.2

algesics 4.1.1.13.1.5

ll analgesics be administered as part of this procedure?

Yes

No

4.1.1.13.1.5.1

algesic Table 4.1.1.13.1.5.1.1

ease complete a row for each analgesic administered as part of this procedure. Use the plus sign to add rows. Scroll the way across the screen to fill in all sections.

nt Name	Route of Administration	Dose	Frequency	Source of Agent

---

4.1.1.13.1.5.2

erimental Agents 4.1.1.13.1.6

ll Experimental Agents be administered as part of this procedure?

Yes

No

4.1.1.13.1.6.1

Appendix 9

ɔerimental Agent Table 4.1.1.13.1.6.1.1

ɜase complete a row for each experimental agent administered as part of this procedure. Use the plus sign to add vs. Scroll all the way across the screen to fill in all sections.

erimental Agent	Route of Administration	Dose	Hazard (Yes or No)	Source of Agent

---

4.1.1.13.1.6.2

ıer Therapeutic Agents 4.1.1.13.1.7

ll other therapeutic agents be administered as part of this procedure?

Yes

No

4.1.1.13.1.7.1

ıer Therapeutic Agents 4.1.1.13.1.7.1.1

ɜase complete a row for each therapeutic drug administered as part of this procedure. Use the plus sign to add rows. roll all the way across the screen to fill in all sections.

nt Name	Route of Administration	Dose	Purpose	Source of Agent

4.1.1.13.1.7.2

4.1.1.13.2

ˈgery 4.1.1.14

ɜurgery proposed as part of this protocol?

Yes

No

4.1.1.14.1

ˈvival Surgery 4.1.1.14.1.1

ll survival surgery be performed?

Yes

No

4.1.1.14.1.1.1

Appendix 9

---

vival Surgical Procedures 4.1.1.14.1.1.1.1

ase select the surgical procedure(s) to be performed.

rgical
ocedures

ltiple Major Survival Surgeries 4.1.1.14.1.1.1.2

ll more than one major survival surgery be performed on an animal as part of this proposal?

Yes

No

4.1.1.14.1.1.1.2.1

ltiple Survival Surgery Plans 4.1.1.14.1.1.1.2.1.1

ase describe design of the multiple survival surgies, i.e., the order of the surgeries, how many survival surgeries will performed on a single animal, etc.

---

ltiple Survival Surgery Justification 4.1.1.14.1.1.1.2.1.2

ase provide a scientific justification for performing multiple survival surgeries on an animal. Cost savings is not an plicable justification.

4.1.1.14.1.1.1.2.2

vival Surgery Location 4.1.1.14.1.1.1.3

ase select the room(s) where the surgery will be performed.

cations (Surgery
d Procedure)

gical Personnel Experience 4.1.1.14.1.1.1.4

ase indicate the training and experience of the surgical personnel in working with this species and performing this ecific procedure. These individuals must also be listed as Protocol Associates on this protocol. Use the plus sign to d rows. Scroll all the way across the screen to fill in all sections.

e of Personnel	Training and Experience with this Species	Training and Experience with this Procedure

---

Appendix 9

-anesthetics and Anesthetics 4.1.1.14.1.1.1.5

ease complete a row for each anesthetic and/or pre-anesthetic drug administered as part of this procedure. Use the s sign to add rows. Scroll all the way across the screen to fill in all sections.

nt	Purpose (pre-anesthetic or anesthetic)	Dose	Route	Frequency/Duration	Source of Agent

---

alytic Agents 4.1.1.14.1.1.1.6

ll Paralytic drugs be used?

Yes

No

4.1.1.14.1.1.6.1

alytic Drugs 4.1.1.14.1.1.1.6.1.1

ease complete a row for each paralytic drug administered as part of this procedure. Use the plus sign to add vs. Scroll all the way across the screen to fill in all sections.

nt	Dose	Route	Frequency/Duration	Source of Agent

---

nitoring 4.1.1.14.1.1.1.6.1.2

w will the absence of pain be assessed in the paralyzed animal?

---

tilation 4.1.1.14.1.1.1.6.1.3

w will ventilation be maintained in the paralyzed animal?

4.1.1.14.1.1.6.2

esthetic Depth 4.1.1.14.1.1.1.7

w will anesthetic depth be monitored? Select all that apply.

esthetic Depth
iteria

Appendix 9

gical Preparation 4.1.1.14.1.1.1.8

ase describe how the animal will be prepped for surgery. Include and pre-surgical food/water restrictions, fur removal, infection of surgical site, and draping.

---

gical Procedure 4.1.1.14.1.1.1.9

mpletely describe the surgical procedure.

---

trument Sterilization 4.1.1.14.1.1.1.10

ase describe (1) How the instruments will be sterilized before surgery and (2) How the instruments will be sterilized tween animals if multiple surgeries are performed at one time. Please not that alcohol is neither a sterilant or a high el disinfectant and is not acceptable.

---

stoperative or Preemptive Analgesia 4.1.1.14.1.1.1.11

ll postoperative or preemptive analgesics be administered?

Yes

No

4.1.1.14.1.1.1.11.1

stoperative or Preemptive Analgesics 4.1.1.14.1.1.1.11.1.1

ase complete a row for each postoperative and/or preemptive analgesic administered as part of this procedure. Use plus sign to add rows. Scroll all the way across the screen to fill in all sections.

nt	Dose	Route	Frequency/Duration	Source of Agent

4.1.1.14.1.1.1.11.2

entific Justification for Withholding Analgesics 4.1.1.14.1.1.1.11.2.1

stoperative or preemptive analgesia is usually indicated for surgical procedures. Please provide scientific justification withholding the use of analgesics.

Appendix 9

ɜtoperative Monitoring and Care 4.1.1.14.1.1.1.12

ɜase describe postoperative monitoring and care. Please note that you are required to keep accurate records of stoperative monitoring and care of all animals, including rodents. This information may be requested for review during pection of surgical areas. Indicate the frequency and duration that animals will be monitored. Indicate who will rform the postoperative monitoring and care.

ɜessing Postoperative Pain, Distress and/or Discomfort 4.1.1.14.1.1.1.13

ɜase indicate all applicable criteria

onitoring of Pain
ıd Distress

4.1.1.14.1.1.2

ı-Survival Surgery 4.1.1.14.1.2

ll non-survival surgery be performed?

Yes

No

4.1.1.14.1.2.1

ı-Survival Surgical Procedure 4.1.1.14.1.2.1.1

ɜase name the Non-Survival surgical procedure

ı-Survival Surgery Location 4.1.1.14.1.2.1.2

ɜase select the room(s) where the procedure will be performed.

ıcations (Surgery
ıd Procedure)

·gical Personnel Experience 4.1.1.14.1.2.1.3

ɜase indicate the training and experience of the surgical personnel in working with this species and performing this ɜcific procedure. These individuals must also be listed as Protocol Associates on this protocol. Use the plus sign to d rows. Scroll all the way across the screen to fill in all sections.

ıe of Personnel	Training and Experience with this Species	Training and Experience with this Procedure

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-anesthetics and Anesthetics 4.1.1.14.1.2.1.4

ease complete a row for each pre-anesthetic and/or anesthetic administered as part of this procedure. Use the plus n to add rows. Scroll all the way across the screen to fill in all sections.

nt	Purpose (pre-anesthetic or anesthetic)	Dose	Route	Frequency/Duration	Source of Agent

---

alytic Agents 4.1.1.14.1.2.1.5

ll Paralytic drugs be used?

Yes

No

4.1.1.14.1.2.1.5.1

alytic Drugs 4.1.1.14.1.2.1.5.1.1

ease complete a row for each paralytic drug administered as part of this procedure. Use the plus sign to add rows. roll all the way across the screen to fill in all sections.

nt	Dose	Route	Frequency/Duration	Source of Agent

---

nitoring 4.1.1.14.1.2.1.5.1.2

w will the absence of pain be assessed in the paralyzed animal?

---

ntilation 4.1.1.14.1.2.1.5.1.3

w will ventilation be maintained in the paralyzed animal?

4.1.1.14.1.2.1.5.2

esthetic Depth 4.1.1.14.1.2.1.6

w will anesthetic depth be monitored? Select all that apply.

nesthetic Depth
iteria

Appendix 9

---

gical Preparation 4.1.1.14.1.2.1.7

ase describe how the animal will be prepped for surgery. Include and pre-surgical food/wather restrictions, fur noval, disinfection of surgical site, and draping.

---

gical Procedure 4.1.1.14.1.2.1.8

mpletely describe the surgical procedure.

-Survival Surgery Euthanasia 4.1.1.14.1.2.1.9

ase describe how the animal(s) will be euthanized after surgery.

4.1.1.14.1.2.2

4.1.1.14.2

straint 4.1.1.15

ll animals be more than momentarily restrained for any procedures as part of this proposal?

Yes

No

4.1.1.15.1

straint Method 4.1.1.15.1.1

ase select the method of restraint. Use the green plus sign to the right to add method(s).

straint Methods

---

longed Restraint Justification 4.1.1.15.1.2

ase provide justification for prolonged restraint. Please detail the methods for monitoring the animal to assure that y do not experience unnecessary pain or distress.

4.1.1.15.2

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od and/or Water Restriction 4.1.1.16

ll access to food or water be restricted as part of this proposal?

Yes

No

4.1.1.16.1

od and/or Water Restriction Description 4.1.1.16.1.1

achments: Special Diet SOP.pdf

ease describe precisely the duration and frequency of food/water restriction. Please follow the attached Institutional licy.

---

od and/or Water Restriction Justification 4.1.1.16.1.2

ease provide justification for food/water restriction. Please detail the methods to be used for monitoring the animals to sure that they do not experience unnecessary pain or distress during food/water restriction.

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Appendix 9

4.1.37.
16.2

noval from the Department of Laboratory Animal Resources 4.2

ll animals ever be removed from DLAR for longer than 12 hours?

Yes

No

4.2.1

Appendix 9

AR Removal Explanation 4.2.1.1

ase explain why animals will be removed from DLAR for longer than 12 hours. Identify where the animals will be ved and the duration of the move.

4.2.2

mal Housing 4.3

ll animals be housed according the the Social Housing/Environmental Enrichment Policy and the Housing Density licy?

Yes

No

4.3.1

4.3.2

sing Description 4.3.2.1

ase describe how animals will be housed and how it varies from University Policy.

---

mption Justification 4.3.2.2

ase provide scientific justification for housing animals in a manner other than as described in the University Policy.

---

ardous Agents 4.4

ll hazardous agents be used in this protocol? This includes infectious agents, carcinogens, toxic chemicals, lioisotopes and recombinant nucleic acids.

Yes

No

4.4.1

ardous Agents 4.4.1.1

ase select ALL hazardous agents used in these experiments.

zardous Agents

isted Hazardous Agents 4.4.1.2

ase list an agents not included in the drop down list above.

Appendix 9

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ndling of Exposed Items 4.4.1.3

e there hazards associated with handling animals, cages, bedding and other materials that have been exposed to this ent(s)?

Yes

No

4.4.1.3.1

ndling of Exposed Items Details 4.4.1.3.1.1

chments: 4-1 Use of Biohazards in the Animal Facility.pdf 4-2 Use of Hazardous Chemicals in the Animal Facility.pdf Appendix A (Hazard-Specific Containment dance).pdf

ease describe the hazards associated with handling animals, cages, bedding and other materials that have been osed to this agent(s). Please reference the attached ARF SOPs. The practices described in these SOPSs must be ed. If these SOPs do not adequately describe the handling of your hazardous agent, please call DLAR at 3.777.8106.

---

sonal Protective Equipment 4.4.1.3.1.2

at precautions must be taken by personnel entering the animal housing room and/or handing animals or materials? lect all that apply.

rsonal Protective quipment

4.4.1.3.2

4.4.2

armaceutical Grade Compounds

armaceutical Grade Compounds 5.1

e all of the compounds described in this protocol (including anesthetics, analgesics, therapeutic agents and perimental agents) pharmaceutical grade? Please note that scientific supply companies, such as Sigma, do not tinely supply pharmaceutical grade drugs.

Yes

No

No compounds are administered as part of this protocol

5.1.1

5.1.2

Appendix 9

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---

n-Pharmaceutical Grade Compounds 5.1.2.1

ease complete a row of the table for each non-pharmaceutical grade compound being used. When providing scientific tification for the use of each non-pharmaceutical grade compounds please note that cost savings is not a applicable tification. Use the green plus button to add rows and be sure to scroll all the way to the right to fill out all columns.

npound	Source	Justification for use of non-pharmaceutical grade

---

5.1.3

mors, Cells, Antibodies, and Biologics

l tumors, cells or biologics of any kind be ADMINISTERED TO ANIMALS as part of this proposal? 6.1

is includes cells, blood, serum, antibodies, etc.

Yes

No

6.1.1

e of Material 6.1.1.1

ease completely describe the material(s) to be used.

---

urce of Material 6.1.1.2

ease provide the source of the material(s).

---

s the material(s) been tested for rodent viruses? 6.1.1.3

ease indicate whether or not the material has been tested for rodent viruses. For rodent cell lines or other cell lines that ve been passaged through rodents, this is REQUIRED by Institutional policy (Attached). ATCC DOES NOT test cell es for rodent viruses. Your protocol cannot be approved until this testing is completed. If you have agents that need to tested, please contact DLAR to discuss the specific rodent viruses that must be evaluated. Use the paperclip symbol the right to attach documents.

Yes, my material has been tested. I have attached certification.

No, my material has not been tested.

My material is exempt from testing requirements.

6.1.1.3.1

6.1.1.3.2

6.1.1.3.3

Appendix 9

---

mption Explanation 6.1.1.4

ase explain why the material is exempt from the testing requirements.

6.1.2

stomized Antibodies 6.2

customized antibodies being obtained for use in this study?

Yes

No

6.2.1

tractor Information 6.2.1.1

ase provide the name and contact information for the Contractor providing the antibodies.

DA Registration 6.2.1.2

he Contractor registered by the USDA?

Yes

No

6.2.1.2.1

DA Registration Number 6 2.1.2.1.1

ase provide the Contractor's USDA registration number.

6.2.1.2.2

ALAC, Int. Accreditation 6.2.1.3

he Contractor accredited by AAALAC, Int.?

Yes

No

6.2.1.3.1

6.2.1.3.2

6.2.2

ld Studies

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es this work include field studies? 7.1

Yes

No

7.1.1

mits 7.1.1.1

ease provide Scientific Collection Permit numbers and photocopies of all permits.

---

perty access 7.1.1.2

ease provide the location of any study sites, property owners and person(s) to contact (including phone numbers) to in access.

---

e of Field Study 7.1.1.3

ease select all that apply to your study.

Live capture and release

Non-survival collection

7.1.1.3.1

thod of Capture - Live capture and release 7.1.1.3.1.1

scribe the method(s) of capture to be used, including device(s) to be used, frequency with which these devices will be ecked, and estimated maximum time animals will be held before release. Pictures and other information may be ached.

---

ease Site - Live capture and release 7.1.1.3.1.2

licate where capture animals will be released. If release is at a site other than the site of capture, expalin and justify.

---

ected Injury and Mortality - Live capture and release 7.1.1.3.1.3

at are the expected injury and/or mortality rates? What will be done to minimize injury and mortality?

---

fidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement Confidentiality Statement

Appendix 9

hanasia in the Event of Injury or Illness - Live capture and release 7.1.1.3.1.4

the event of injury or illness necessitating euthanasia, what method will be used and who will perform procedure? ıat method will be used to dispose of carcasses?

ı-Target Captures - Live capture and release 7.1.1.3.1.5

ıat precautions will be taken to reduce non-target captures?

---

rking - Live capture and release 7.1.1.3.1.6

ıat marking procedures will be used? Please describe in detail.

---

od Collection and Other Sampling - Live capture and release 7.1.1.3.1.7

ılood or other tissue samples are to be taken, describe procedure(s) to be used, including number and weight or ume or sample(s) to be taken. Also, describe procedures taken to prevent infection and minimize pain & distress.

---

ninistration of Pharmaceuticals - Live capture and release 7.1.1.3.1.8

lrugs or pharmaceuticals are to be administered to animals, indicate which drug(s), reason for use, dosage, how it will administered. Attach copies of any permits necessary. If drugs are not used, explain why drugs that might alleviate in or distress will be withheld.

---

nitoring of Animals - Live capture and release 7.1.1.3.1.9

scribe procedures for monitoring animal health and what parameters will be used to determine health status.

---

sonnel Safety - Live capture and release 7.1.1.3.1.10

scribe additional precautions taken to ensure the safety of personnel involved (above those outlined in the cupational health program?) For example, Hantavirus, tick-transmitted diseases.

7.1.1.3.2

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ding Interval - Non-survival collection 7.1.1.3.2.1

w long will animals be held prior to sacrifice?

cedures - Non-survival collection 7.1.1.3.2.2

scribe all procedures to be performed.

ı-Target Captures - Non-survival collection 7.1.1.3.2.3

scribe precautions that will be taken to prevent non-target mortalities.

cass Disposal - Non-survival collection 7.1.1.3.2.4

w will carcasses be disposed?

posal Documentation - Non-survival collection 7.1.1.3.2.5

ıat documents will be maintained to document prop[illegible] disp[illegible]sal and where will this documentation be located? Sample cuments may be attached.

sonnel Safety - Non-survival collection 7.1.1.3.2.6

ıat precautions will be taken to ensu[illegible] the safety of personnel involved?

7.1.2

ernatives and Duplication

ionale for Animal Use 8.1

r each animal species/strain listed above, describe the characteristics that justify its use in the proposed study.

Appendix 9

nsideration of Alternatives 8.2

ease describe your consideration of alternatives and your determination that alternatives are not available. Delineate e methods and sources used in the search. Please perform a literature search for alternatives to animal use and licate the databases searched, the date of the search, period covered, and keywords used. Alternatives include ethods that (1) refine existing tests by minimizing animals distress (2) reduce the number of animals necessary for an periment, or (3) replace whole-animals use with in vitro or other tests. When ascites production is used to produce tibodies, justification needs to be given as to why in vitro systems cannot be used. The dates should cover the time riod when any relevant work was done in the field being studied.

---

plication of Studies 8.3

es this study represent duplication of previously published studies?

Yes

No

8.3.1

plicative Study Justification 8.3.1.1

hat new information is anticipated in the current study to justify duplication?

8.3.2

ification that Studies are not Duplicative 8.3.2.1

lineate the methods and sources used to determine that these studies do not duplicate previously published studies. ease perform a literature search for duplicate studies and indicate the databases searched, the date of the search, riod covered, and keywords used. The dates should cover the time period when any relevant work was done in the d being studied.

---

ncipal Investigator's Assurance

Appendix 9

ncipal Investigator's Assurance Statement 9.1

ese assurances must be certified by the Principal Investigator; an E-signature will be required. THE E-SIGNATURE JST BE SUBMITTED BY THE PI WHEN THE PROTOCOL IS SUBMITTED.
ssure that all the information contained in this Animal Use Proposal is true and all the animal procedures described for s study accurately summarize the nature and extent of the proposed use of animals. If this project is to be funded by ramural source, I further assure that this proposal accurately reflects all procedures involving laboratory animals scribed in the grant application to the funding agency.
gree to abide by the provisions of the Guide for the Care and Use of Laboratory Animals (National Research Council, tional Academy Press), the Animal Welfare Act (PL 89-544 and Amendments), and the University of South Carolina licies for the care and use of animals.
ertify that this project does not unnecessarily duplicate previously reported experimental work.
ssure that every effort has been made to minimize the number of animals used.
ssure that every effort has been made to reduce the amount of pain, distress, and/or discomfort these animals must perience. I understand that if I cannot be contacted in the event that animals in this project show evidence of distress, ess, or pain, emergency care, including euthanasia if necessary will be administered at the discretion of the veterinary dical staff.
ill promptly notify the IACUC regarding any unexpected study results that impact the health and well-being of the imals.
m aware that no change(s) to the final approved proposal may be initiated without prior written approval from the CUC.
nderstand that approval of this proposal is for a maximum of three (3) years. If animal work on the project is to continue yond three years, a new Animal Use Proposal must be submitted. An annual review is required.

I agree.

I do not agree.

9.1.1

9.1.2

ice Use Only

Author System Generated 10.1

---

es the AUP contain surgical procedure(s)? 10.2

rgery? Yes/No

---

es the AUP contain multiple survival surgical procedures? 10.3

ultiple Survival Surgery? Yes/No

---

es the AUP contain prolonged physical restraint? 10.4

olonged Physical Restraint? Yes/No

---

es the AUP include food/water restriction or deprivation? 10.5

od and/or Water Restriction? Yes/No

---

es the AUP involve the use of hazardous agents? 10.6

azardous agents in AUP? Yes/No

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es the AUP involve the use of Non-Centralized Facilities? 10.7

on-Centralized Facilities? Yes/No

---

es the AUP contain USDA-covered species? 10.8

SDA Species? Yes/No

---

es the AUP contain exception(s) to the Environmental Enrichment/Group Housing Policy? 10.9

nrichment/Housing exemption? Yes/No

---

es the AUP contain exceptions to The Guide for the Care and Use of Laboratory Animals? 10.10

xceptions to The Guide? Yes/No

---

her Comments 10.11

Appendix 9

Appendix 10: IACUC/OB Periodic Report

Please attached a copy of the latest facilities (including laboratory inspections) and program assessment report conducted by the IACUC/OB.

UNIVERSITY OF
SOUTH CAROLINA
Office of Research

Institutional Animal Care
and Use Committee

MEMORANDUM

TO: Dr. Prakash Nagarkatti
Vice President for Research

Mr. Thomas Coggins
Institutional Official and Director, Office of Research Compliance

FROM: Institutional Animal Care and Use Committee

DATE: April 5, 2018

SUBJECT: Semiannual Evaluation of Animal Care and Use Program and Inspection of Facilities

---

This report summarizes the IACUC's results of its most recent program review and facility inspection, as required by the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals (Policy), Section IV.B.1.-3., the *Guide for the Care and Use of Laboratory Animals* (*Guide*), and the Animal Welfare Act (AWA) regulations, as applicable. Submission of semiannual reports to the Institutional Official is a condition of this institution's Animal Welfare Assurance with the NIH Office of Laboratory Animal Welfare (OLAW).

I. Description of the Nature and Extent of the Institution's Adherence to the PHS Policy, the *Guide*, and the AWA

Departures from the PHS Policy, the *Guide*, and the AWA.
Select A or B:
[X] A. There were no departures during this reporting period.
[ ] B. The following departures have been reviewed and approved by the IACUC:

Graduate Science Research Center, Suite 102 • Columbia, South Carolina 29208 • 803-777-8106 • Fax 803-777-2849

An Equal Opportunity Institution

II. Deficiencies in the Institution's Animal Care and Use Program

Animal Care and Use Program Review Date(s): March 1, 2018
Select A or B:
[X] A. There were no deficiencies in the program during this reporting period.
[ ] B. The following deficiencies have been identified:

III. Deficiencies in the Institution's Animal Facility

Animal Facility Inspection Date(s): February 19-27, 2018
Select A or B:
[ ] A. There were no deficiencies in the animal facility during this reporting period.
[X] B. The following deficiencies have been identified: ***See attached table.***

IV. Minority Views

Select A or B:
[X] A. No minority views were submitted or expressed.
[ ] B. The following minority views were expressed:

V. Status of AAALAC Accreditation [*identify accredited facilities, if applicable*]

Accredited facilities include:
USC main campus and the School of Medicine (SOM).

VI. Signatures

Dr. Ken Walsh

Dr. Shayne Barlow

[redacted]

[redacted]

By signing the above, I hereby declare the Semiannual Program Review and Facilities Inspection Summary for Spring 2018 to be accurate to the best of my knowledge.

Spring 2018 Inspection

Year	Spr/Fall	Bldg	Room	A/M/S	Problem	Correction	Date	Responsible	Date for correction
2018	Spring	All DLAR	[redacted]	m	Bedding is touching the wall	Remove bedding from against the wall	2/27/2018	DLAR	3/15/2018
2018	Spring	All DLAR	[redacted]	m	Clean cages not covered	Cover clean cages	2/27/2018	DLAR	3/15/2018
2018	Spring	DSC	[redacted]	m	Rack 154 and 156 no sanitation sticker	Provide sanitation date and sticker	2/27/2018	DLAR	3/15/2018
2018	Spring	DSC	[redacted]	m	Food mill date (8/26)	Throw out food	2/27/2018	DLAR	3/15/2018
2018	Spring	DSC	[redacted]	m	Multiple racks out of date	Clean/sanitize racks	2/27/2018	DLAR	8/27/2018
2018	Spring	DSC	[redacted]	m	Food bin open	Keep food bin closed when not in use	2/27/2018	DLAR	immediately
2018	Spring	DSC	[redacted]	m	Open bed nest on rack	Seal bed nests in container; attracts vermin	2/27/2018	DLAR	immediately
2018	Spring	GSRC	[redacted]	m	Sharps container full; trash in sharps container	Empty sharps container, dispose of trash properly	2/27/2018	DLAR	3/15/2018
2018	Spring	GSRC	[redacted]	m	Clean cages not covered	Cover clean cages	2/27/2018	DLAR	3/15/2018
2018	Spring	GSRC	[redacted]	m	rack 31 no sanitation sticker	Provide sanitation sticker and clean if needed	2/27/2018	DLAR	3/15/2018
2018	Spring	GSRC	[redacted]	m	Vaporizer dates not given, no log to verify	Vaporizer canisters must be weighed before and after each use	2/27/2018	DLAR	3/15/2018
2018	Spring	GSRC	[redacted]	m	Cabinet monoject needles out of date (10/2015)		2/27/2018	DLAR	3/15/2018
2018	Spring	GSRC	[redacted]	m	Left vaporizer (9/2011) surgery	Vaporizer canister needs to be certified	2/27/2018	DLAR	3/15/2018
2018	Spring	SOM 04	[redacted]	m	Multiple racks out of date	Clean/sanitize racks	2/19/2018	DLAR	3/15/2018
2018	Spring	SOM 04	[redacted]	m	Cashwash external and internal signs incorrect	Correct cagewash signs	2/19/2018	DLAR	immediately
2018	Spring	DSC	[redacted]	m	use of isoflurane in hood despite signage that hood is out of order	Do not use hood in this room until further notice	2/27/2018	Exercise	3/15/2018

Spring 2018 Inspection

2018	Spring	DSC	[redacted]	m	Sharps container full (3)	Dispose of/replace sharps container	2/27/2018	Exercise	3/15/2018
2018	Spring	CLS	[redacted]	m	Rack 1 fish tanks not labeled with AUP	Animals must be visibly associated with their AUP; Label rack 1 fish tanks with AUP	2/20/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Half a CocaCola beverage found in animal area	Do not place human food or beverages in animal rooms	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Cage cards incomplete (no AUP information)	Complete cage cards with necessary information	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Rack 1 cage cards name illegible #82	Label cards	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Dirty operant chambers	Clean operant chambers	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Dirty lab coat wadded up in corner	Clean and store lab coat properly	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Rusty, unwrapped razor blades (6) on counter by sink	Dispose of razor blades	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Expired alcohol swabs	Dispose of exposed alcohol swabs	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Razor blade on table	Store blade properly when not in use	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Razor blade open on floor	Dispose of razor blade	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Unsecured gas cylinder behind door	Gas cylinders must be tightly secured	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Cardboard in room	Remove cardboard	2/27/2018	PI	Immediately
2018	Spring	DSC	[redacted]	m	Pack of gum on counter	Do not place human food or beverages in animal rooms	2/27/2018	PI	Immediately
2018	Spring	DSC	[redacted]	m	Recapped needles in cardboard box	Do not recap needles after use; dispose of properly in sharps container only	2/27/2018	PI	Immediately
2018	Spring	DSC	[redacted]	m	Room dirty, trash on floor and spilling out of trash bag	Clean room	2/27/2018	PI	Immediately
2018	Spring	DSC	[redacted]	m	2 vaporizers out of date (2014)	Have vaporizers certified	2/27/2018	PI	3/15/2018

Spring 2018 Inspection

2018	Spring	DSC	[redacted]	m	Sharps container full (3)	Dispose of/replace sharps container	2/27/2018	Exercise	3/15/2018
2018	Spring	CLS	[redacted]	m	Rack 1 fish tanks not labeled with AUP	Animals must be visibly associated with their AUP; Label rack 1 fish tanks with AUP	2/20/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Half a CocaCola beverage found in animal area	Do not place human food or beverages in animal rooms	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Cage cards incomplete (no AUP information)	Complete cage cards with necessary information	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Rack 1 cage cards name illegible #82	Label cards	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Dirty operant chambers	Clean operant chambers	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Dirty lab coat wadded up in corner	Clean and store lab coat properly	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Rusty, unwrapped razor blades (6) on counter by sink	Dispose of razor blades	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Expired alcohol swabs	Dispose of exposed alcohol swabs	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Razor blade on table	Store blade properly when not in use	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Razor blade open on floor	Dispose of razor blade	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Unsecured gas cylinder behind door	Gas cylinders must be tightly secured	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Cardboard in room	Remove cardboard	2/27/2018	PI	immediately
2018	Spring	DSC	[redacted]	m	Pack of gum on counter	Do not place human food or beverages in animal rooms	2/27/2018	PI	immediately
2018	Spring	DSC	[redacted]	m	Recapped needles in cardboard box	Do not recap needles after use; dispose of properly in sharps container only	2/27/2018	PI	immediately
2018	Spring	DSC	[redacted]	m	Room dirty, trash on floor and spilling out of trash bag	Clean room	2/27/2018	PI	immediately
2018	Spring	DSC	[redacted]	m	2 vaporizers out of date (2014)	Have vaporizers certified	2/27/2018	PI	3/15/2018

Spring 2018 Inspection

2018	Spring	DSC	[redacted]	m	Xylazine expired (1995)	Dispose of expired materials	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	Feces, bedding in operant chambers	Clean operant chambers	2/27/2018	PI	3/15/2018
2018	Spring	DSC	[redacted]	m	4 Single-housed, unmarked animals (3F, 4K-N)	All single-housed animals must have single-housing cage cards in place and marked	2/27/2018	PI	Immediately
2018	Spring	DSC	[redacted]	m	Overcrowded cages; weaning card 2/6 not addressed; multiple mixed-sex cages	Wean as required by AUP	2/27/2018	PI	Immediately
2018	Spring	DSC	[redacted]	m	Rack 3 #86, single-housed animal with unmarked card	All single-housed animals must have single-housing cage cards in place and marked	2/27/2018	PI	Immediately
2018	Spring	EWS	[redacted]	m	Light suspended over tank (back right corner)	Electrocution hazard; light must be secured by attachment, not suspended by wires	2/20/2018	PI	3/15/2018
2018	Spring	GSRC	[redacted]	m	Cage cards incomplete (no contact information)	Complete cage cards with necessary information	2/27/2018	PI	3/15/2018
2018	Spring	GSRC	[redacted]	m	open cages sitting in entryway	Clean cages should be covered; dirty cages should be taken to cagewash	2/27/2018	PI	3/15/2018
2018	Spring	GSRC	[redacted]	m	Vaporizer lacks certification sticker	Verify certification	2/27/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	Hood broken	Fix hood	2/19/2018	PI	8/1/2018
2018	Spring	SOM 01	[redacted]	m	Canisters not weighed since 2016, surgery log filled out through present	Vaporizer canisters must be weighed before and after each use	2/19/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	CO2 not being administered as per Guide	Discontinue use of CO2 tank until compliant with Guide requirements	2/19/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	Needles recapped	Do not recap needles after use	2/19/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	PBS dripping on floor	Slip hazard; contain drip	2/19/2018	PI	3/15/2018

Spring 2018 Inspection

2018	Spring	SOM 01	[redacted]	m	Tupperware-style container used for anesthesia; hole cut in top for CO2 tube, top is cracked	Use intact anesthetic chamber	2/19/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	Large amount of hazardous waste for pick up	Contact SOM/vendor for waste removal	2/19/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	Carbocaine expired 11/14	Dispose of properly or if used for non-survival surgery, clearly label it for non-survival surgery ONLY	2/19/2018	PI	3/15/2018
2018	Spring	SOM 01	[redacted]	m	Isoflurane in unapproved hood	Use isoflurane only in approved hood	2/19/2018	PI	3/15/2018
2018	Spring	SOM 04	[redacted]	m	Cage cards incomplete	Complete cage cards with necessary information	2/19/2018	PI	3/15/2018
2018	Spring	SOM 04	[redacted]	m	No mill or open dates on food	Label food with mill and open dates	2/19/2018	PI	3/15/2018
2018	Spring	SOM 04	[redacted]	m	Open razor blade on counter	Store blade properly when not in use	2/19/2018	PI	3/15/2018
2018	Spring	SOM 04	[redacted]	m	Trash container full	Empty trash	2/19/2018	PI	3/15/2018
2018	Spring	SOM 04	[redacted]	m	Vaporizer canisters not properly weighed/recorded	Vaporizer canisters must be weighed before and after each use	2/19/2018	PI	3/15/2018
2018	Spring	GSRC	[redacted]	m	Cage cards incomplete (pero), no information	Complete cage cards with necessary information	2/27/2018	PI	3/15/2018
2018	Spring	Jones	[redacted]	m	AUP # not provided on rack	Label with AUP #	2/20/2018	PI	3/15/2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Summarize the heating, ventilation and air conditioning (HVAC) systems for each animal facility, ***including all satellite facilities***. Include ***all animal holding rooms*** (including satellite holding rooms), surgical facilities, procedure rooms, and support spaces integral to animal facilities (e.g., cage wash, cage and feed storage areas, necropsy, treatment).

Location/Building/Facility:	**Graduate Science Research Center**

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The unit that feeds the GSRC has a 100% outside air AHU. The air is a one pass unit that feeds VAV boxes to every room. Each room is equipped with a VAV box with individual stat for each box. The main AHU has a heating coil that fails open when power is lost. This feature is to ensure that the chilled water coils in the AMU do not freeze and rupture. Each VAV box has a heating coil for re-heat and will fail closed when the heat is not needed. Monitoring is redundant. USC Facilities monitors the supply air to each room through a Metasys (Johnson Controls) control system. This system monitors the air pressures in and out of the room, ventilation in each area, and monitors the temperature in each area. USC Facilities are notified when any parameters are outside of preset norms. DLAR monitors all animal areas through a Rees Scientific Monitoring system. This system monitors light cycles, temperature, and humidity in real time and alerts the Facility Manager and Attending Veterinarian when any parameters are outside of preset norms.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Location/Building/Facility:	**School of Medicine**

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The School of Medicine animal facility has a 100% outside air AHU. The unit is equipped to handle up to 6700 nominal cfm air flow and 100% exhaust with a heat recovery wheel, steam preheat, and steam humidification. VAV boxes with hot water reheat serve individual rooms independently of the AHU and are controlled by pneumatic thermostats for individual room set points. USC SoM Facilities monitors the supply air to each room through a Metasys (Johnson Controls) control system. This system monitors the air pressures in and out of the room, ventilation in each area, and monitors the temperature in each area. USC Facilities are notified when any parameters are outside of preset norms. DLAR monitors all animal areas through a Rees Scientific Monitoring system. This system monitors light cycles, temperature, and humidity in real time and alerts the Facility Manager and Attending Veterinarian when any parameters are outside of preset norms.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Location/Building/Facility:	**Discovery Biomedical Research Building**

In the text box below, provide a general description of the mechanical systems used to provide temperature, humidity and air pressure control. Include details such as:

- the source(s) of air and air recirculation rates if other than 100% fresh air
- treatment of air (filters, absorbers, *etc.*)
- design features such as centralized chilled water, re-heat coils (steam or hot water), individual room vs. zonal temperature and relative humidity control, the use of variable air volume (VAV) systems and other key features of HVAC systems affecting performance
- features that minimize the potential for adverse consequences to animal well-being (such as re-heat coils that fail closed or that are equipped with high-temperature cut-off systems), and
- how room temperature, ventilation, and critical air pressures are monitored and maintained in the event of a system or component failure, including notifying appropriate personnel in the event of a significant failure that occurs outside of regular working hours and/or other management systems used to respond to alerts or failures.

The unit that serves Discovery has a 100% outside air AHU. The air is a one pass unit that feeds VAV boxes to every room. Each room is equipped with a VAV box with individual stat for each box. The main AHU has a heating coil that fails open when power is lost. This feature is to ensure that the chilled water coils in the AMU do not freeze and rupture. Each VAV box has a heating coil for re-heat and will fail closed when the heat is not needed.

USC Facilities monitors each room through a Metasys (Johnson Controls) control system. This system monitors the air pressures in and out of the room, ventilation in each area, and monitors the temperature in each area. USC Facilities are notified when any parameters are outside of preset norms.

DLAR monitors all animal areas through a Rees Scientific Monitoring system. This system monitors light cycles, temperature, and humidity in real time and alerts the Facility Manager and Attending Veterinarian when any parameters are outside of preset norms.

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

In the Table below, provide room-specific information requested. For each room within this location, indicate use, including the species for animal housing rooms. *Measurement of air exchange rates and verification of relative pressure within animal housing rooms (excluding rooms housing aquatic species only) and cage washing facilities must be completed* ***within the 12 months preceding completion of this Program Description.*** Air exchange rates may be important to maintain air quality in other areas; *however, measurements may be left at the discretion of the institution.* Information may be provided in another format, providing all requested data is included. **[*Note*: Please remove the examples provided in the Table below.]**

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
GSRC								
[redacted]	Clean Cage Storage	70°F	N	N/A	N	+	7.254	April 2018
[redacted]	Animal holding	70°F	Y	65°F - 75°F	N	-	10.465	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	11.262	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	12.527	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	11.963	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	10.733	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	13.034	April 2018
[redacted]	Surgery clean supply	70°F	N	N/A	N	+	10.159	April 2018
[redacted]	Autoclave	70°F	N	N/A	N	-	119.524	April 2018
[redacted]	Procedure Room	70°F	N	N/A	N	+	15.095	April 2018
[redacted]	Surgeon Prep	70°F	N	N/A	N	+	8.034	April 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Large O.R.	70°F	N	N/A	N	+	16.148	April 2018
[redacted]	Recovery	70°F	N	N/A	N	-	10.359	April 2018
[redacted]	Animal Prep	70°F	N	N/A	N		10.202	April 2018
[redacted]	Storage	70°F	N	N/A	N	+	10.061	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	10.700	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	12.468	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	14.505	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	12.336	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	13.084	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	14.066	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	10.416	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	13.626	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	10.926	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	11.111	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	+	13.626	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	13.204	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	11.250	April 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	10.760	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	10.732	April 2018
[redacted]	Animal Holding	72°F	Y	67°F - 77°F	N	-	12.128	April 2018
[redacted]	Animal Holding	72°F	Y	67°F - 77°F	N	-	11.658	April 2018
[redacted]	Animal Holding	72°F	Y	67°F - 77°F	N	-	10.911	April 2018
[redacted]	Procedure / Lab	70°F	N	N/A	N	-	12.242	April 2018
[redacted]	Laboratory	70°F	N	N/A	N	-	14.799	April 2018
[redacted]	Necropsy	70°F	N	N/A	N	-	19.423	April 2018
[redacted]	Custodial	70°F	N	N/A	N	-	9.478	April 2018
[redacted]	Laundry	70°F	N	N/A	N	-	6.749	April 2018
[redacted]	Chemical Storage	70°F	N	N/A	N	-	10.489	April 2018
[redacted]	Feed Storage	70°F	N	N/A	N	-	6.639	April 2018
[redacted]	DNA Lab	70°F	N	N/A	N	-	13.030	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	10.718	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	11.922	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	10.891	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	12.057	April 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	10.264	April 2018
[redacted]	Peromyscus Anteroom	70°F	N	N/A	N	+ to corridor	11.155	April 2018
[redacted]	Peromyscus Holding	70°F	Y	65°F - 75°F	N	-	10.691	April 2018
[redacted]	Peromyscus Holding	70°F	Y	65°F - 75°F	N	-	10.947	April 2018
[redacted]	Peromyscus Holding	70°F	Y	65°F - 75°F	N	-	10.294	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	10.702	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	11.930	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	12.564	April 2018
[redacted]	Laboratory	70°F	N	N/A	N	+	12.993	April 2018
[redacted]	Laboratory	70°F	N	N/A	N	+	13.367	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	+	11.447	April 2018
[redacted]	Anteroom	70°F	N	N/A	N	+	6.905	April 2018
[redacted]	Women's Locker	70°F	N	N/A	N	-	7.051	April 2018
[redacted]	Men's Locker	70°F	N	N/A	N	-	5.480	April 2018
[redacted]	Breakroom	70°F	N	N/A	N	+	28.828	April 2018
[redacted]	Soiled cage area	70°F	N	N/A	N	-	10.691	April 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Clean cage area	70°F	N	N/A	N	+ to dirty side - to corridor	8.620	April 2018
Discovery								
[redacted]	Clean Storage	70°F	N	N/A	N	+	11.131	April 2018
[redacted]	Laboratory	70°F	N	N/A	N	-	41.359	April 2018
[redacted]	Soiled cage area	70°F	N	N/A	N	-	11.131	April 2018
[redacted]	Clean cage area	70°F	N	N/A	N	+	41.359	April 2018
[redacted]	Gowning	70°F	N	N/A	N	-	13.140	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	22.756	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	18.435	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	17.206	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	17.824	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	21.214	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	22.071	April 2018
[redacted]	Laboratory	70°F	N	N/A	N	-	37.101	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	19.907	April 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	19.907	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	20.243	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	20.495	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	20.131	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	20.457	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	21.867	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	21.509	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	19.263	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	19.846	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	24.255	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	21.120	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	22.754	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	23.234	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	23.750	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	23.000	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	24.511	April 2018
[redacted]	Animal cubicle	70°F	Y	65°F - 75°F	N	-	23.375	April 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Laboratory	70°F	N	N/A	N	-	30.368	April 2018
[redacted]	Laboratory	70°F	Y	65°F - 75°F	N	-	11.083	April 2018
[redacted]	Laboratory	70°F	N	N/A	N	-	11.234	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	10.897	April 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	11.200	April 2018
School of Medicine								
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	14.4	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	13.8	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	14.8	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	13.6	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	15.3	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	12.2	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	15.2	July 2018
[redacted]	Procedure	70°F	N	N/A	N	-	26.0	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	14.3	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	14.2	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	16.5	July 2018

Appendix 11: Heating, Ventilation and Air Conditioning (HVAC) System Summary

Room No.	Specific Use	Temperature Set-Point (define units)	Electronic / Emergency Monitoring of Temperatures (Y/N)	Alert/Alarm Temperature Ranges (if applicable; define units)	Humidity Control (Y/N)	Relative Pressure	Air Exchange Rate (per hour)	Date Verified / Measured
		(settings to be verified)					(values to be measured)	
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	18.4	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	15.9	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	15.3	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	16.3	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	20.8	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	31.1	July 2018
[redacted]	Animal Holding	70°F	Y	65°F - 75°F	N	-	20.9	July 2018
[redacted]	Rodent Surgery	70°F	N	N/A	N	-	10.3	July 2018

[Create additional rows by pressing TAB in the bottom-right box.]

Copy and repeat the Description and Table for each location, including all satellite housing locations.

Appendix 12: Aquatic Systems Summary – Part II

Please summarize water management and monitoring information programs for each animal facility, including all satellite facilities, rooms, enclosures. The following key will assist you in completing the form:

(1) List location of aquaria, including outdoor enclosures (ponds or outdoor tanks). If indoors, list building and room number. Note that all species housed at the same location and maintained via the same design and monitoring may be listed in the same row.
(2) Please indicate if embryonic (E), larval (L), juvenile (J) or Adult (A)
(3) Group tanks (ponds, outdoor tanks, multiple aquaria) are arranged as arrays with shared water supply; individual aquaria have exclusive water handling systems.
(4) Indicate water type, e.g., fresh, brackish, or marine.
(5) Indicate water pre-treatment, e.g., dechlorination, rough filters.
(6) Indicate water circulation, e.g., static, re-circulated, constant flow, or some combination of these. If applicable, indicate water exchange frequency and amount (percentage).
(7) Provide a key word for filtration employed, e.g., biological, chemical, mechanical, and type (e.g., mechanical-bead filter). A diagram may be provided showing the flow of water, filtration, source of "make-up" water and amount replaced daily.

Part I

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
Jones Physical Science [redacted]	Zebrafish	Group	Fresh	Tap water from the main sink is fed through an Aquatec LT-200 reverse osmosis (RO) system (200 GPD) and delivered to a reservoir before entering system.	Re-circulated water system, with 60 gallons (10%) of total system volume automatically exchanged every 24 hours (and 10% water exchanged per tank daily).	System water passed through four filtration stages: 1) 50-µm mechanical filter; 2)Fluidized Bed Biofilter; 3) 2 successive 25-µm FSI filters; 4) ultraviolet sterilizer.	Mechanical and biological filtration followed by UV sterilization
Coker Life Sciences [redacted]	Zebrafish	Group	Fresh	Tap water from the main sink is fed through a Millipore RiOs reverse	Re-circulated Tank: 6 tank exchanges per hour System:	Main System: System water passed through three filtration stages:	Following filtration, system water passed over UV bulbs before delivery to tanks.

Appendix 12: Aquatic Systems Summary – Part II

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
				osmosis (RO) system and delivered to a reservoir before entering system.	10% of total system volume automatically exchanged every 24 hours	1) 120-µm filter pad; 2) combined moving and submerged-bed biological filtration; 3) 50-µm rotating drum filter Quarantine System: System water passed through four filtration stages: 1) 120-µm filter pad; 2) combined moving and submerged-bed biological filtration; 3) 80-µm filter; 4) 50-µm filter	
Baruch Marine Field Lab Seawater Laboratory (air conditioned and screened buildings) used for all fish culture activities USC Georgetown	*Gobiosoma bosc* *Hypsoblennius hentz* *Hypsoblennius ionathus* *Chasmodes bosquianus* *Hypleuroblennius geminatus*	Adults, isolated and sometimes in small groups within plastic or glass containers with holes to allow flow in and out; immersed in water table that serves as common 'bath'; Same for all species	Flow through chambers with shared natural tidal creek (marine) water supplied by the facility's pump system	Raw creek (marine) water passes through sand filter beds, resulting in 50-100 micron filtered water	Continuous supply; containers designed to allow minimum of three full water exchanges per hour	Mechanical. But No additional filtering after water is delivered from the sand bed filter	None needed or advisable for maintaining adults

Appendix 12: Aquatic Systems Summary – Part II

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
Baruch Marine Field Lab Seawater Laboratory (air conditioned and screened buildings) used for all fish culture activities USC Georgetown	*Gobiosoma bosc* *Hypsoblennius hentz* *Hypsoblennius ionathus* *Chasmodes bosquianus* *Hypleuroblennius geminatus*	Embryos (within eggs deposited in adhering sheets by adults); each nest isolated within plastic or glass container with holes to allow flow in and out; immersed in water table that serves as common 'bath'; Same for all species	Flow through chambers with shared natural tidal creek (marine) water supplied by the facility's pump system	Raw creek (marine) water passes through sand filter beds, resulting in 50-100 micron filtered water	Continuous supply; containers designed to allow minimum of three full water exchanges per hour	Mechanical. But No additional filtering after water is delivered from the sand bed filter	None needed or advisable for maintaining nests
Baruch Marine Field Lab Seawater Laboratory (air conditioned and screened buildings) used for all fish culture activities USC Georgetown	*Gobiosoma bosc* *Hypsoblennius hentz* *Hypsoblennius ionathus* *Chasmodes bosquianus* *Hypleuroblennius geminatus*	Larvae (hatched from nests); each batch (cohorts) isolated in a 2 liter aquaria	Closed containers immersed in a common water bath (water table) with continuous flow to maintain desired ambient temperature	Pre-filtered natural creek water from sand filtered supply line.	Static but complete water changes at least every 48 hours	Mechanical; sand filtered water passed through 5 micron, then 1 micron filters; reservoir of about 140 liters kept available for start-ups and water changes as needed	None needed or advisable for maintaining larvae to settlement stage (batches of larvae typically maintained for up to 15 days.
EWS [redacted] 180-gallon Display aquarium	All Adult	Individual	Marine	none	Re-circulated through 55-gallon	Biological live rock, Mechanical protein skimmer	none

Appendix 12: Aquatic Systems Summary – Part II

Location (1)	Species (2)	System Design					
		Group / Individual (3)	Water Type (4)	Pre-treatment (5)	Circulation (6)	Filtration (7)	Disinfection (e.g., UV, ozone)
	1 Yellow tang *Zebrasoma flavescens* 1 Hippo tang *Paracanthurus hepatus* 1 clownfish *Amphiprion sp.* 2 gobies *Amblyeleotris sp.* 2 Pajama cardinals *Sphaeramia nematopterus*				sump with auto top-off		
EWS [redacted] 125-gallon Display aquarium	Scopas tang *Zebrasoma scopas*, Sailfin tang *Zebrasoma velifer*, and a leopard wrasse *Macropharyngodon meleagris*	Individual	Marine	none	Re-circulated through 40-gallon sump with auto top-off	Biological live rock, Mechanical protein skimmer	none
EWS [redacted] 120-gallon reserve / support / quarantine tank for tropical display aquariums	No fish currently housed	Individual	Marine	none	Re-circulated through 40-gallon head tank with auto top-off	Biological live rock, biological growth of macro-algae in refugium & removal,	none

Appendix 12: Aquatic Systems Summary – Part II

Location (1)	**Species (2)**	**System Design**					
		Group / Individual (3)	**Water Type (4)**	**Pre-treatment (5)**	**Circulation (6)**	**Filtration (7)**	**Disinfection (e.g., UV, ozone)**
						Mechanical protein skimmer	

Note: Records of equipment maintenance (filter changes, UV bulb changes, probe changes, calibrations, *etc.*) should be available for review.

The following key will assist you in completing this form:

1. (1) In these columns, please indicate monitoring frequency, e.g. daily, weekly, monthly or other point sampling frequency; continuous/real time, or none, if applicable. Also indicate method of control (heaters versus room HVAC, hand versus auto dosing, etc.).
2. (2) Indicate other parameters and their monitoring frequency, e.g., alkalinity, total hardness, conductivity, chlorine/chloramine.

Part II

Monitoring ***Indicate in the boxes below the frequency of monitoring and method of control for the following parameters. (1)***									
Location (from Part I)	**Temperature**	**Salinity**	**pH**	**NH_4**	**NO_2**	**NO_3**	**Dissolved O_2**	**Total Dissolved Gases**	**Other. Please List (2):**
Jones Physical Science [redacted]	Freq. of monitoring: Continuous Method of control: heater within sump	Freq. of monitoring: Continuous Method of control: n/a	Freq. of monitoring: Continuous Method of control: Auto-dosing of sodium bicarbonate solution	Freq. of monitoring: Monthly Method of control: Combined moving and submerged-bed biological filtration	Freq. of monitoring: Monthly Method of control: Combined moving and submerged -bed biological filtration	Freq. of monitoring: Monthly Method of control: Combined moving and submerged-bed biological filtration	Freq. of monitoring: Continuous Method of control: Air diffusers provide supplemental aerarion	Freq. of monitoring: None Method of control: Air diffusers provide degassing	Conductivity Freq. of Monitoring: Method of control: Auto-dosing of saltwater solution Alkalinity Freq. of Monitoring: Monthly Method of control: None

Appendix 12: Aquatic Systems Summary – Part II

Monitoring

Indicate in the boxes below the frequency of monitoring and method of control for the following parameters. (1)

Location (from Part I)	**Temperature**	**Salinity**	**pH**	**NH_4**	**NO_2**	**NO_3**	**Dissolved O_2**	**Total Dissolved Gases**	**Other. Please List (2):**
Coker Life Sciences [redacted]	Freq. of monitoring: Continuous Method of control: heater within sump	Freq. of monitoring: Continuous Method of control: n/a	Freq. of monitoring: Continuous Method of control: Auto-dosing of sodium bicarbonate solution	Freq. of monitoring: Monthly Method of control: Combined moving and submerged-bed biological filtration	Freq. of monitoring: Monthly Method of control: Combined moving and submerged-bed biological filtration	Freq. of monitoring: Monthly Method of control: Combined moving and submerged-bed biological filtration	Freq. of monitoring: Continuous Method of control: Air diffusers provide supplemental aerarion	Freq. of monitoring: None Method of control: Air diffusers provide degassing	Conductivity Freq. of Monitoring: Method of control: Auto-dosing of saltwater solution Alkalinity Freq. of Monitoring: Monthly Method of control: None
EWS [redacted] 180-gallon Display aquarium	ntinuous Heater & evaporating fan on controller	weekly	As needed	As needed	As needed	As needed	N/A	N/A	Visual inspection of corals in system will indicate water quality issue long before it becomes problematic for fish health. Multi-year stabilized display
EWS [redacted] 75-gallon Display aquarium	ntinuous Heater & evaporating fan on controller	weekly	As needed	As needed	As needed	As needed	N/A	N/A	Visual inspection of corals in system will indicate water quality issue long before it becomes problematic for fish health. Multi-year stabilized display

Appendix 12: Aquatic Systems Summary – Part II

Monitoring ***Indicate in the boxes below the frequency of monitoring and method of control for the following parameters. (1)***									
Location (from Part I)	**Temperature**	**Salinity**	**pH**	**NH_4**	**NO_2**	**NO_3**	**Dissolved O_2**	**Total Dissolved Gases**	**Other. Please List (2):**
EWS [redacted] 180-gallon reserve / support / quarantine tank for tropical display aquariums	Continuous Heater/chiller on controller	weekly	As needed	As needed	As needed	As needed	N/A	N/A	Visual inspection of corals in system will indicate water quality issue long before it becomes problematic for fish health. Multi-year stabilized display
EWS [redacted] 90-gallon Display aquarium	Daily Room HVAC	daily	daily	As needed	As needed	daily	N/A	N/A	none
EWS [redacted] 10-gallon holding tank	Daily Room HVAC	N/A	daily	As needed	As needed	daily	N/A	N/A	none

Appendix 13: Primary Enclosures and Animal Space Provisions

Please complete the Table below considering performance criteria and guiding documents (e.g., Guide, Ag Guide, ETS 123 and/or other applicable standards) used by the IACUC/OB to establish adequacy of space provided for all research animals including traditional laboratory species, agricultural animals, aquatic species, and wildlife when reviewing biomedical, field, and agricultural research studies.

Species	Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)	Maximum Number Animals / Enclosure	Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)	Enclosure Composition & Description**
Pig	7 @ 6'd x 3'w x 3.5'h 6 @ 8'd x 3'w x 3.5'h 2 @ 8'd x 4'w x 3.5'h	2	*Guide*, Animal Welfare Regulations (AWR)	Stainless steel, open-top pens with divider gates, elevated/suspended floor, and suspended feeders.
Rat	17"d x 9"w x 8" h	3 (Except for breeders with young)	*Guide*	Polycarbonate shoebox cages with stainless steel wire bar lid feeder and water bottle.
Rat	10.75" x 14" x 7"h	3 (Except for breeders with young)	*Guide*	Polysulfone IVC mouse cages (Allentown Inc.) with wire bar lid/feeder and water bottle.
Rat	10¼"d x 8"w x 7⅝"h	1	*Guide*	Stainless steel suspended wire-bottom cage. Temporary housing used for timed mating on a 24 hour bases at which point animals are returned to a solid-bottom home cage.
Mouse	11"d x 7"w x 5"h	5 (Except for breeders with young)	*Guide*	Polycarbonate shoebox cages with stainless steel wire bar lid/feeder and water bottle.

Appendix 13: Primary Enclosures and Animal Space Provisions

Species	**Dimensions of Enclosure (cage, pen, tank*, corral, paddock, etc.)**	**Maximum Number Animals / Enclosure**	**Guiding Document Used to determine the Institution's Space Standards (Guide, Ag Guide, ETS 123, Other)**	**Enclosure Composition & Description****
Mouse	11 ½ "d x 7"w x 5"h	5 (Except for breeders with young)	*Guide*	Jag75 Polysulfone IVC mouse cages (Allentown Inc.) with wire bar lid/feeder and water bottle.
Mouse	14"d x 6"w x 5"h	5	Guide	Sealsafe Plus plastic IVC mouse cages (Tecniplast) with wire bar lid/feeder and water bottle.
Peromyscus	11¼ "d x 8"w x 6"h	3-6 based on size	*Guide*	Polypropylene shoe box cages with wire bar lid/feeder and water bottle.

*For aquatic species, provide tank volume.

**Include descriptors such as open-topped, static microisolator, individually-ventilated cage systems (IVCS).

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Please describe the cleaning and disinfection methods in the Table below. Note the washing/sanitizing frequency and method for each of the following:

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Micro-environment				
Solid-bottom cages (static)	Mechanical washer	Mice: 2x/weekly minimum Peromyscus: 1-2x/week Rats: 1-2 per cage - 2x/week 3 or more – 3x/week Diabetic – daily	Alka-det HW	
Solid-bottom cages (IVC)	Mechanical washer	Once/week	Alka-det HW	
Suspended wire-bottom or slotted floor cages	Manual spray and cleaning	Once/daily	Alka-det HW	
Cage lids	Mechanical washer	Once/month	Alka-det HW	
Filter tops	Mechanical washer	Once/month	Alka-det HW	
Cage racks and shelves	Mechanical washer	Once/month	Alka-det HW	

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Cage pans under suspended cages	N/A	N/A	N/A	N/A
Play pens, floor pens, stalls, etc.	Mechanical washer		Alka-det HW	
Corrals for primates or outdoor paddocks for livestock	N/A	N/A	N/A	N/A
Aquatic, amphibian, and reptile tanks and enclosures	Manual cleaning	As needed	Alka-det HW	All aquaria are PI maintained
Feeders	Mechanical washer	Rodent feeders in wire bar lids – 1x/month Pigs – weekly	Alka-det HW	
Watering devices	Mechanical washer	A clean bottle is provided weekly as cage is changed and as needed based on usage. Bottles are not refilled.	Alka-det HW	
Exercise devices and manipulanda used in environmental	Mechanical washer	Once/week	Alka-det HW	

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	**Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)**	**Washing/ Sanitizing Frequency**	**Chemical(s) Used***	**Other Comments (e.g., autoclaved)**
enrichment programs, etc.				
Transport cages	Mechanical washer	After use	Alka-det HW	
Operant conditioning & recording chambers, mechanical restraint devices (chairs, slings, etc.)	Manual cleaning	After use	Dependent on PI choice. 70% ethanol and HALO most common.	PI maintained
Euthanasia chambers	Manual cleaning	After use	Halo	
Macro-Environment				
Animal Housing Rooms:				
Floors	Sweep & mop	Daily (M-F)	Sani-plex	Halo fogging prior to empty rooms being used.
Walls	Dusted/wet mopped	Quarterly and as needed	Sani-plex	Halo fogging prior to empty rooms being used.
Ceilings	Dusted/wet mopped	Quarterly	Sani-plex	Halo fogging prior to empty rooms being used.
Ducts/Pipes	Soft brush or sponge	Weekly	Sani-plex	Halo fogging prior to empty rooms being used.
Fixtures	Sponge	Daily – Sinks	Halo	Halo fogging prior to empty rooms being used. Sani-plex

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
Corridors:				
Floors	Sweep & mop Mechanical scrubber/buffer	Daily M-F As needed	Sani-plex	
Walls	Dusted/wet mopped	As needed	Sani-plex	
Ceilings	Dusted/wet mopped	As needed	Sani-plex	
Ducts/Pipes	Soft brush or sponge	As needed	Sani-plex	
Fixtures	Sponge	Daily – Sinks	Halo	
Support Areas (e.g., surgery, procedure rooms, etc.); complete for each area:				
Floors	Sweep & mop (cage wash areas may be sprayed with high-pressure hoses and squeegeed dry based on technicians preference)	Surgery rooms: After each use Labs: As needed based on usage	Sani-plex	

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
		Procedure: As needed based on usage Cage wash: daily Other support areas: As needed		
Walls	Dusted/wet mopped	As needed	Sani-plex	
Ceilings	Dusted/wet mopped	As needed	Sani-plex	Wet mops machine washed or replaced after each use.
Ducts/Pipes	Soft brush or sponge	As needed	Sani-plex	Wet mops machine washed or replaced after each use.
Fixtures	Sponge	Daily – Sinks	Halo	
Implements (note whether or not shared):				
Mops	Mechanical washer	Mop pads replaces and washed weekly or more		All animal rooms are equipped with individually assigned Swiffer style mops. Only the pad is

Appendix 14: Cleaning and Disinfection of the Micro- and Macro-Environment

Area	Washing/Sanitizing Method (mechanical washer, hand washing, high-pressure sprayers, etc.)	Washing/ Sanitizing Frequency	Chemical(s) Used*	Other Comments (e.g., autoclaved)
		frequently when needed		replaced and washed at this frequency.
Mop buckets	Mechanical washer	After each use		Traditional mop and mop buckets are only used in support areas.
Aquaria nets	Replaced by PI	As needed		PI maintained
Other:				
Vehicle(s)	Sweep & mop ot High-pressure hose & sanitize	After each use when animals or caging(clean or dirty) are being transported	Halo	

*Please provide chemical, not trade name.

Appendix 15: Facilities and Equipment for Sanitizing Materials

In the Tables below, summarize the facilities and equipment used to sanitize animal related equipment (tunnel washer, bottle washer, rack washer, bulk autoclave, hand-washing area, bedding dispensing unit, *etc.*). Note that some descriptions may be combined if all share identical features (e.g., all rack washers).

[*Note*: Please remove the examples provided in the Table below.]

Building	Room No.	Equipment Type	Safety Feature(s)	Methods of Monitoring Effectiveness
GSRC	[redacted]	Tunnel Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides, instructional signage	Guarantee 180-degree hot water rinse; temperature-sensitive tape used weekly; swabs cultured monthly
GSRC	[redacted]	Rack Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides, instructional signage	Guarantee 180-degree hot water rinse; temperature-sensitive tape used weekly; swabs cultured monthly
GSRC	[redacted]	Autoclaves	Emergency "off" button	Temperature-sensitive tape used each run
GSRC	[redacted]	Bedding dispenser	Emergency "off" button	Visual observation
Discovery	[redacted]	Tunnel Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides, instructional signage	Guarantee 180-degree hot water rinse; temperature-sensitive tape used weekly; swabs cultured monthly
Discovery	[redacted]	Rack Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides, instructional signage	Guarantee 180-degree hot water rinse; temperature-sensitive tape used weekly; swabs cultured monthly
Discovery	[redacted]	Autoclave	Emergency "off" button	Temperature-sensitive tape used each run
Discovery	[redacted]	Bedding dispenser	Emergency "off" button	Visual observation
SoM	[redacted]	Tunnel Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides, instructional signage	Guarantee 180-degree hot water rinse; temperature-sensitive tape used weekly; swabs cultured monthly
SoM	[redacted]	Rack Washer	Emergency "off" button; labeled exit door, de-energizing cord on both sides, instructional signage	Guarantee 180-degree hot water rinse; temperature-sensitive tape used weekly; swabs cultured monthly
SoM	[redacted]	Autoclave	Emergency "off" button	Temperature-sensitive tape used each run

Appendix 16: Lighting Summary

Using the Table below, summarize the lighting system(s) for the animal housing facility(ies). For each species or holding room type, list light intensity (range), construction features (e.g., water resistance), photoperiod (light:dark) and control (e.g., automatic versus manual, phasing). For systems automatically controlling photoperiod, describe override mechanisms (including alarms, if applicable).

Location:	**GSRC, SoM, Discovery**

[*Note*: Please remove the examples provided in the Table below.]

Room Type[a]	**Light Intensity Range**	**Lighting Fixture Construction Features**[b]	**Photo-period** (hrs)[c]	**Photoperiod and Lighting Control**	**Override Mechanisms** (if applicable)
Rodent Holding Rooms	130-300 lux	Surface mounted, water resistant	12:12 10:14 8:16	Automatic via building management system or wall mounted timers	Mechanical timer set at 30 minutes; recorded as "alarm" in building management system
Swine Holding Rooms	300-400 lux	Surface mounted, water resistant	12:12	Automatic via building management system	Mechanical on/off switch
Surgery	500 lux	Recessed, water resistant; arm-mounted, water resistant	NA	N/A	N/A
Necropsy	Not measured	Recessed, water resistant; arm-mounted, water resistant	NA	N/A	N/A
Cage-Washing Room	Not measured	Recessed, water proof	NA	N/A	N/A

[Create additional rows by pressing TAB in the bottom-right box.]

[a] A list of each room is not needed; group or cluster rooms by species or function

[b] Include such features as water resistance, red lighting, *etc.*

[c] Note if light cycle inverted/reversed.

Repeat Location and Table as necessary for each location, including satellite housing locations.

Appendix 17: Satellite Housing Facilities

Note: In the Program Description Section 2. IV. (Physical Plant), item C., describe the criteria used to determine a "Satellite Animal Holding Area." In the Table below, summarize these animal housing areas. Note that each of these must also be included in the Heating, Ventilation, and Air Conditioning (HVAC) Summary (**Appendix 11**) and Lighting Systems Summary (**Appendix 16**).

Building	Room(s)	Person Responsible	Species Used	Approximate Area (ft^2 or m^2) Devoted to Housing	Maximum Period of Stay	Purpose / Rationale / Justification	Construction Features and Finishes
Jones Physical Science	[redacted]	[redacted]	Zebrafish	400 sq ft	Permanent	Zebrafish are PI maintained	Floors - troweled epoxy over concrete. Walls - masonry walls or sheetrock coated with epoxy. Ceilings – animal room ceilings are solid double-layer gypsum board with epoxy coating.
Coker Life Sciences	[redacted]	[redacted]	Zebrafish	400 sq ft	Permanent	Zebrafish are PI maintained	Floors - troweled epoxy over concrete. Walls - masonry walls or sheetrock coated with epoxy. Ceilings – animal room ceilings are solid double-layer gypsum board with epoxy coating.
Earth and Water Science	[redacted]	[redacted]	Fish	1,800 sq ft	Permanent	PI maintained research and display tanks	Floors - troweled epoxy over concrete.

Appendix 17: Satellite Housing Facilities

Building	**Room(s)**	**Person Responsible**	**Species Used**	**Approximate Area (ft^2 or m^2) Devoted to Housing**	**Maximum Period of Stay**	**Purpose / Rationale / Justification**	**Construction Features and Finishes**
							Walls - masonry walls or sheetrock coated with epoxy. Ceilings – animal room ceilings are solid double-layer gypsum board with epoxy coating.

[Create additional rows by pressing TAB in the bottom-right box.]